ANALYZING DIATOM IMAGES

USING

PLANE REGULAR SHAPE THEORY

A FURTHER TREATISE ON A THEORY OF SHAPE

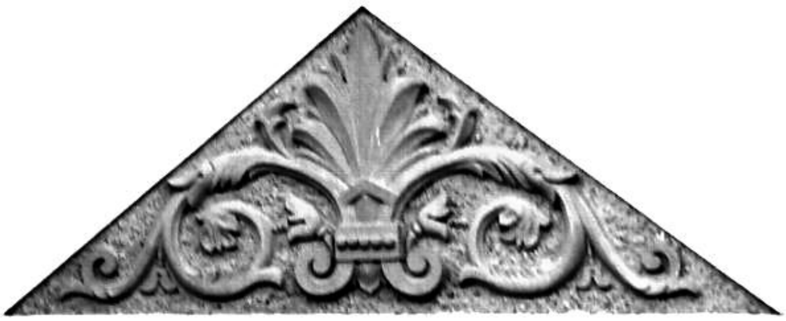
WHO KNEW WHAT & WHEN?
HOW DID THEY KNOW?

A CONTRIBUTION TOWARDS THE THEORY OF EVERYTHING

PART OF AN INTRO TO SUPERSYMMETRY?

By

John Marcus Crombie



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10 9 8 7 6 5 4 3 2 1

He too knew the square root of two.

and

He knew the square root of two too.

Welcome to my world

Where "threeness" and "threefold" may be called **Equilateral Triangles.**
Where "fiveness" and "fivefold" may be called **Pentagrams.**
Where "fourness" and "fourfold" may be called **Squares.**

WHERE A SPADE IS CALLED A SPADE!
WHERE MANY LOOK BUT NONE SEE!

WHERE MOTHER NATURE'S SECRETS HAVE BEEN HIDDEN IN PLAIN SIGHT!

HOW LONG HAS MOTHER NATURE KNOWN THESE SECRETS?

*"The pennate forms were earlier described by Schrader (1969). Their age is Runangan to early Whaingaroan (Edwards 1991), thus fitting neatly into the Late Eocene-Early Oligocene at about **32-35** or so **million** years ago."*

OAMARU DIATOMS, By David B. Richman, Mesilla Park, New Mexico U.S.A.
And Richard Carter, Hebei Normal University, Shijiazhuang, China

[PDF]Page 5 - Microscopy-uk.eu *www.microscopy-uk.eu/diatomist/ADvol24.pdf*

*"The variety of forms present in the Oamaru diatomite is astonishing in comparison with most other sites. Some of the diatoms are triangular (often with various **ornamentations**), others circular, boat-shaped, hexagonal, pentagonal, square, spindle-shaped, shaped like watches or helmets, and some shapes are difficult to describe at all."*

And that does not include the Plane Regular Shapes portrayed on their frustules.

IF FREQUENCY FORMS PLANE REGULAR SHAPES (AS IN CYMATICS) WHAT WAS THE SOURCE OF THE FREQUENCIES THAT GAVE THE VARIOUS PLANE REGULAR SHAPES TO THE DIATOMS ***32-35*** *OR SO MILLION YEARS AGO, BOTH TO THEIR OUTER FORMS AND TO THEIR ADORNMENT*?

WHAT WE KNOW FROM OUR KNOWLEDGE BASES IS THAT:

"In the beginning was the Word."

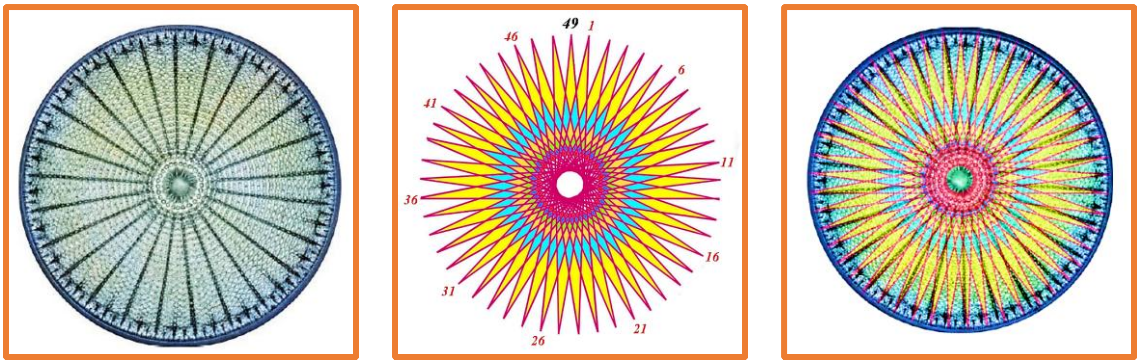
Research of Shapes on Diatoms should not be restricted to the construction of their outer Shapes.

The S.E.M. images of frustules that I have been able to obtain, peruse and visually disect persuade me to the view that the portrayal of Plane Regular Shapes on the outside of these frustules is more than simply adornment. Even a diminutive perusal of Cymatics should persuade researchers that the presence of Plane Regular Shapes on the frustules is not simply serendipity but is a fact of extreme relevance to their research.

Add to this the concept that is Cymatics where attempts have been made over centuries to identify and then associate certain frequencies with the creation of certain shapes. I have myself been employed in these endeavours with some success. I have portrayed below some of the endeavours that I have attempted in the field of Diatom research.

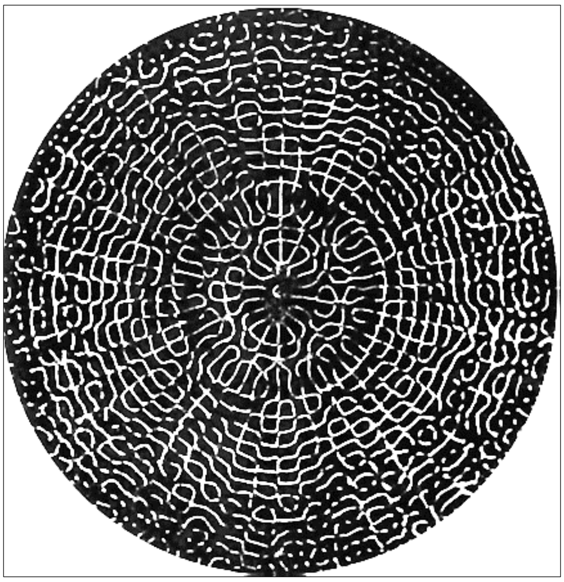
e.g. Identifying Inner and Outer Circles on Diatoms that identify the Shape:

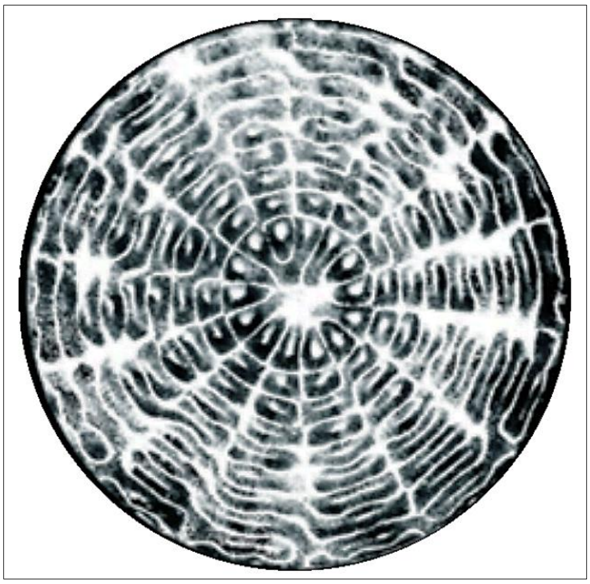
49 POINT DIATOM AND POLYGRAM



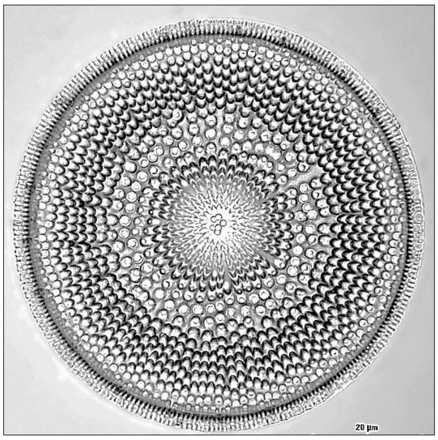
JENNY'S CYMATICS IMAGES:

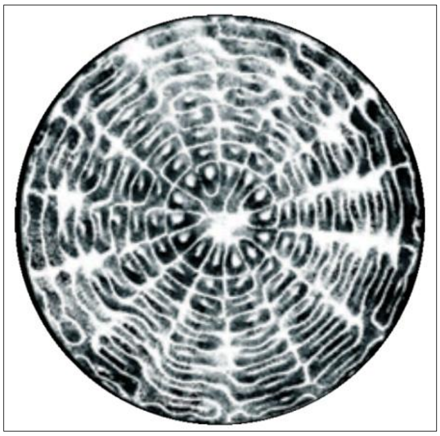
These two images may initially be thought to be S.E.M. images of Diatoms but they are in fact images of Cymatics results from the work of Hans Jenny. These images by themselves should be explicit indicators to the science that is involved in the formation of Diatoms and their adornments.





Coscinodiscus ovicentrum

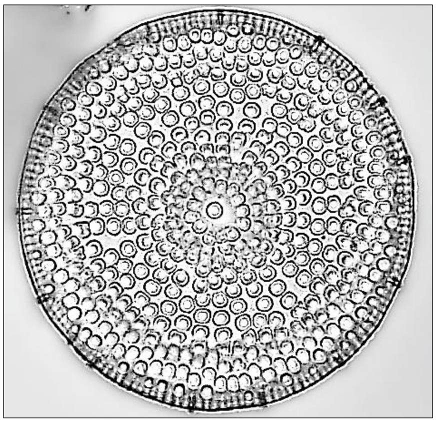


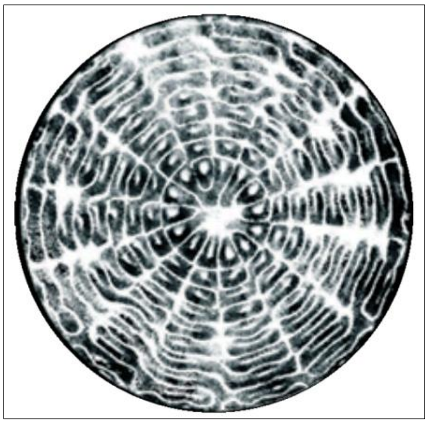


Coscinodiscus ovicentrum

Jenny's Cymatics image
Using a frequency

Coscinodiscus superbus

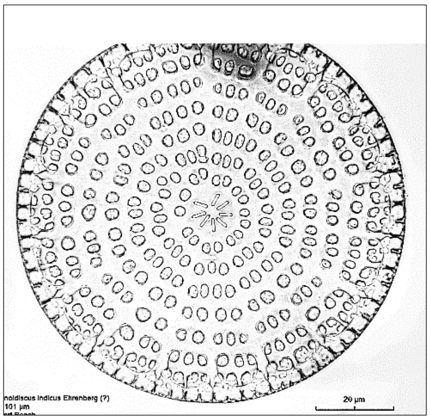


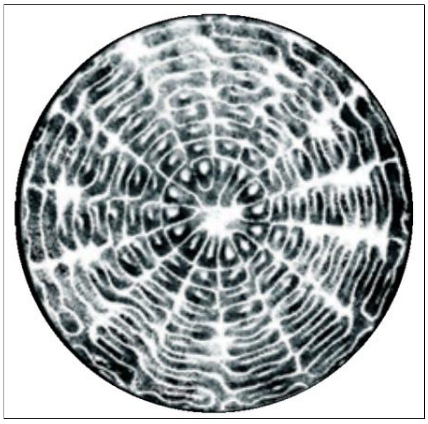


Coscinodiscus Superbus

Jenny's Cymatics image
Using a frequency

Arachnoidiscus indicus



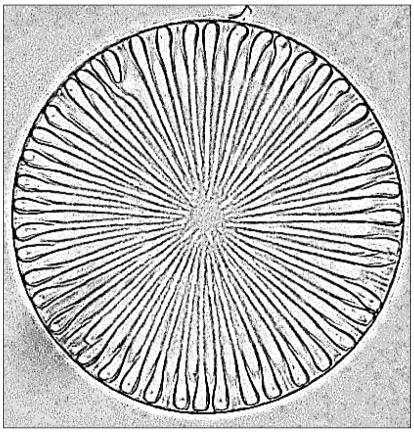


Arachnoidiscus indicus

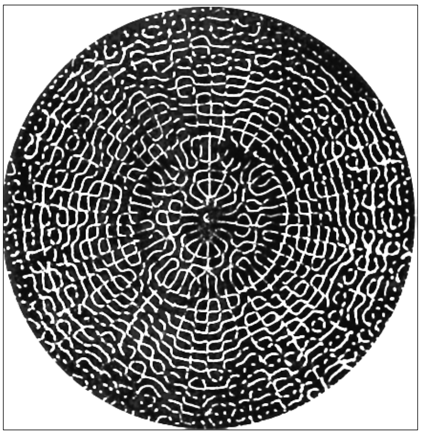
Jenny's Cymatics image
Using a frequency

Are patterns displayed on Diatom Frustules also caused cymatically by Frequencies?

Melosira clavigera

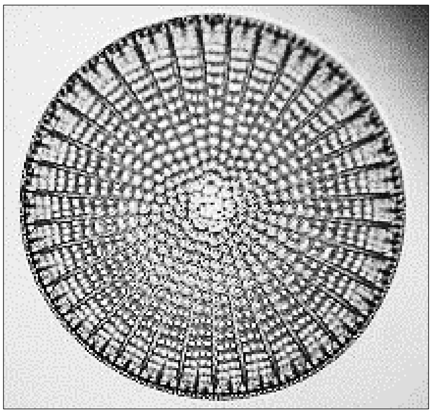


Melosira clavigera

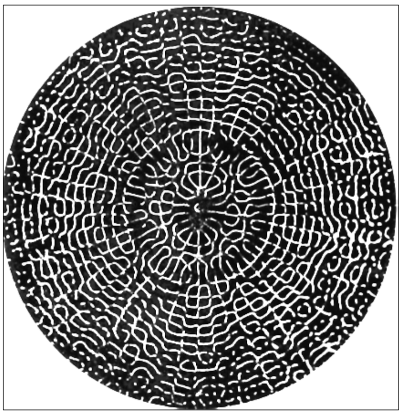


Jenny's Cymatics image
Using a frequency

Arachnoidiscus sendaicus



Arachnoidiscus sendaicus



Jenny's Cymatics image
Using a frequency

HANS JENNY

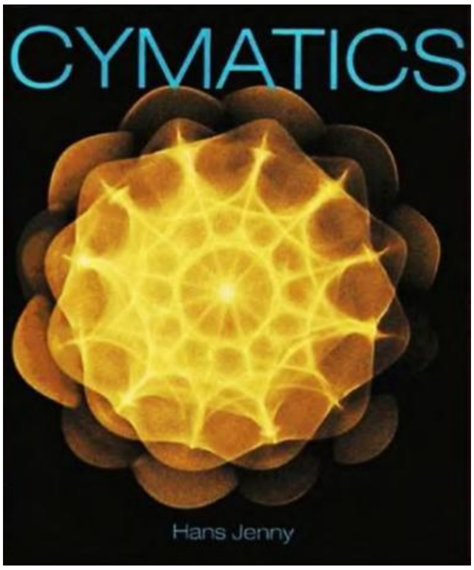
CYMATICS

A Study of Wave Phenomena and Vibration

A complete compilation of the original two volumes by Hans Jenny.

Volume 1, 1967
The structure and dynamics of waves and vibrations.

Volume 2, 1974
Wave phenomena, vibrational effects and harmonic oscillations with their structure, kinetics and dynamics.



Hans Jenny's Classical Image interpreted:

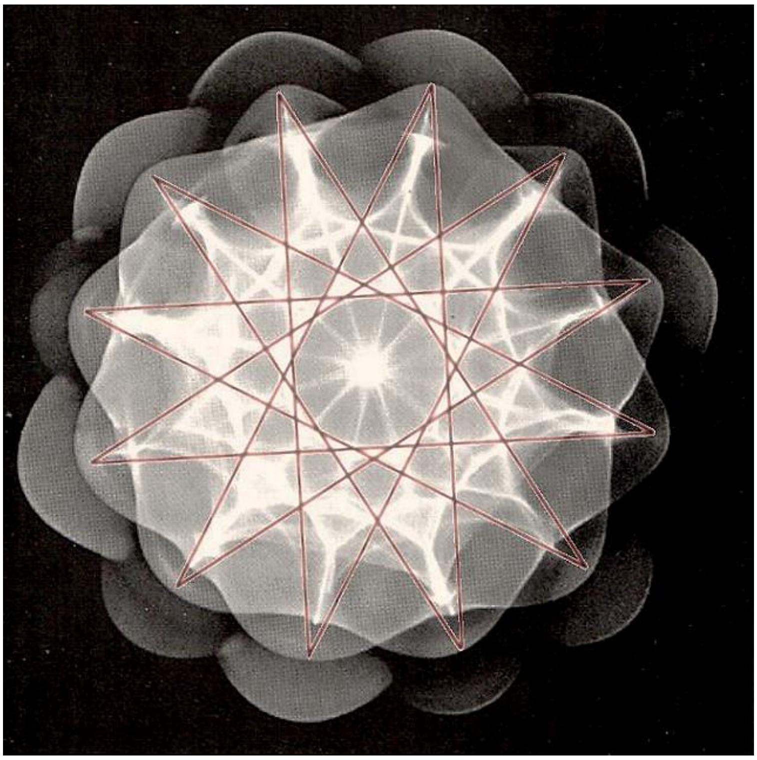
This image is Classic as it clearly and graphically portrays all the component shapes that combine to form the geometry of the 12 point Polygram.

Made up from:

1 12 Sided Polygon	*1 x12 = 12*
2 Hexagons in Phase	2 x 6 = 12
3 Squares in Phase	3 x 4 = 12
4 Equilateral Triangles in Phase	4 x 3 = 12

Overall it portrays a 12 point polygram with its component parts.

It is also a tribute to the manner in which shapes operate *In Phase* with themselves, an attribute that enables Prime numbered shapes to be *hidden in plain sight* as pseudo Non-Prime shapes.



It also provides the Graphical Mathematics for the image.

Plane Regular Shape Ratios may be assigned to the Graphical Mathematics revealed in the image.

SHAPE	***RATIO***
2 Hexagons	1.154700538379250
3 Squares	1.414213562373100
4 Equilateral Triangles	2.000000000000000
1 Polygram with 12 sides	3.853220324

We have become so accustomed to seeing ***Plane Regular Shapes*** around us in the Universe and on the Planet in which we reside that it seems to us to have become unnecessary to analyse them to explain or justify their existence. They exist, multiply, divide without any Input from us so we simply take them for granted and we expect their continued occurrence in our world. But, perhaps it is the case that we just cannot see the forest for trees.

We have never enquired whether each shape and its ratio may have had a mathematical and / or graphical relationship to every other shape and its ratio.

The contents of my *Genome of Shape* contain sequences of numbers, mostly Infinite, that form a unique system of Mathematics that may be used to measure many aspects of our Universe. Unfortunately for the *Pure Mathematicians* among us they may have to eventually accept results that are Infinite. They need to get used to working with Infinite entities. This Infinity seems to be the Mathematics of the Universe.

What I find significant is the fact that these shapes appeared on the frustules of Diatoms 30 to 35 million years ago and were also then mathematically and graphically correct. They would also have qualified to participate in a Genome of Shape with its Infinite Ratios. They would have been allowed entrance to Plato's Academy.

It seems also that a great number of Diatoms portray PRIME numbered Plane Regular Shapes *In Phase*; a fact which made me reassess my library of Plane Regular Shape drawings. In many cases I found that what initially appeared to be an even numbered Shape was in fact an odd numbered Prime shape *In Phase with itself* two or more times. This fact should also be of interest to Marcus Du Sautoy who researches *"Primes in Nature"*. Primes may be there but give the appearance of being Non-Primes.

A way to identify the identity of the applicable shape is to locate the shape's Circumscribing Circle and its Inscribing Circle; count the number of radials; select an applicable shape, make it transparent, and lay it over the diatom image. If the Circles and Radials match then you have your applicable shape, making sure whether or not that it is a shape in phase.

So, basically, the concepts of Mathematics, Infinity, Primes, Primes in Phase, and the makings of a Genome of Shape actually physically existed in our Universe on Diatoms over 35 million years ago. But researchers have also attributed the 'pores' that I identify with Shape to the Diatom's ability to focus incoming light to the part of the frustule where it is most useful.

And yes, there is a measuring stick that can be applied in both the Quantum world and in the world of the Standard Theory that doesn't require a Unit of Measurement:

THE MATHEMATICS OF PLANE REGULAR SHAPE RATIOS
e.g. 'Shape X Shape = Shape

EXTRACTS FROM RECENT DIATOM RESEARCH INFO:

'Diatoms are found world-wide and were first discovered and shown in a drawing by an Englishman, Charles King in 1703 - Tabellaria sp. (D. G. Mann, 2020)'.
'Since then diatoms have been studied by both amateur microscopists and researchers for several hundred years'.

'Diatoms are often cleaned and prepared for mounting on a microscope slide by burning them, washing them in hydrogen peroxide, acid or bleach to remove their intracellular components leaving only their clear silica (glass) shells. The silica shells can survive for millions of years forming large diatom deposits which are mined (e.g. Red Lake Earth deposit in British Columbia).'

'Researchers estimate there are at least 10,000 species of Diatoms world-wide. Their taxonomy is primarily based on their shell structure and there are two main groups of diatoms: centric and pennate diatoms.'

'Diatomaceous earth is made up of diatom fossils consisting of about 80-90% silica with some alumina (2-4%) and 0.5 to 2% iron (Wikipedia). Fossilized diatoms are available from retailers online and some stores. Diatomaceous earth is used as: a filtration aid, mild abrasive, filler, support for chemical catalysts, in litter boxes, as a stabilizer in dynamite, thermal insulation, in potted plants and to absorb fluids. In addition it is used as an insecticide and kills: ants, bedbugs, silver fish, flies, flour beetles, and spider mites. It acts by lacerating the digest tract and absorbing oils and fats from the insect cuticle (Health Canada). It also kills beneficial insects such as bees so be careful if using it in your garden.'

By Robert Berdan Ph.D.
Posted by Motic America on February 14, 2023

[PDF] nature.com

Wavelength and orientation dependent capture of light by diatom frustule nanostructures

J Romann, JC Valmalette, MS Chauton, G Tranell… - Scientific Reports, 2015 - nature.com

'… Light absorption and photosynthesis occur in the chloroplasts and in **centric diatoms** such as **Coscinodiscus** . . . the numerous, small chloroplasts are distributed towards the cell surface. …'

'The optical properties of a cleaned single valve (one half of a frustule) from the diatom Coscinodiscus centralis were studied using confocal micro-spectroscopy.'

'A ***photonic crystal*** function in the frustule was observed and analysis of the ***hyperspectral mapping*** revealed an enhancement of transmitted light around 636 and 663 nm. These ***wavelengths*** match the ***absorption maxima*** of chlorophyll a and c, respectively. Additionally, we demonstrate that a highly efficient light trapping mechanism occurred, resulting from ***strong asymmetry*** between the cribrum and foramen ***pseudo-periodic structures***. This effect may prevent transmitted light from being backscattered and in turn enhance the light absorption. Based on our results, ***we hypothesize that the multi-scaled layered structure of the frustule improves photosynthetic efficiency by these three mechanisms***.'

- enhancement of transmitted light
- light trapping mechanism
- enhance the light absorption

electron microscopy

[Insight into diatom frustule structures using various imaging techniques]

Article Open access15 July 2021

'The **optical properties of the frustule** described here may contribute to the ecological success of diatoms in both lentic and marine ecosystems and should be studied further *in vivo*.'

'The different layers with pores of different diameters and patterns in the frustule of *C. centralis* (Fig. 1) appeared to be an effective light trapping and modulating structure (i.e. ***a photonic waveguide***)'.

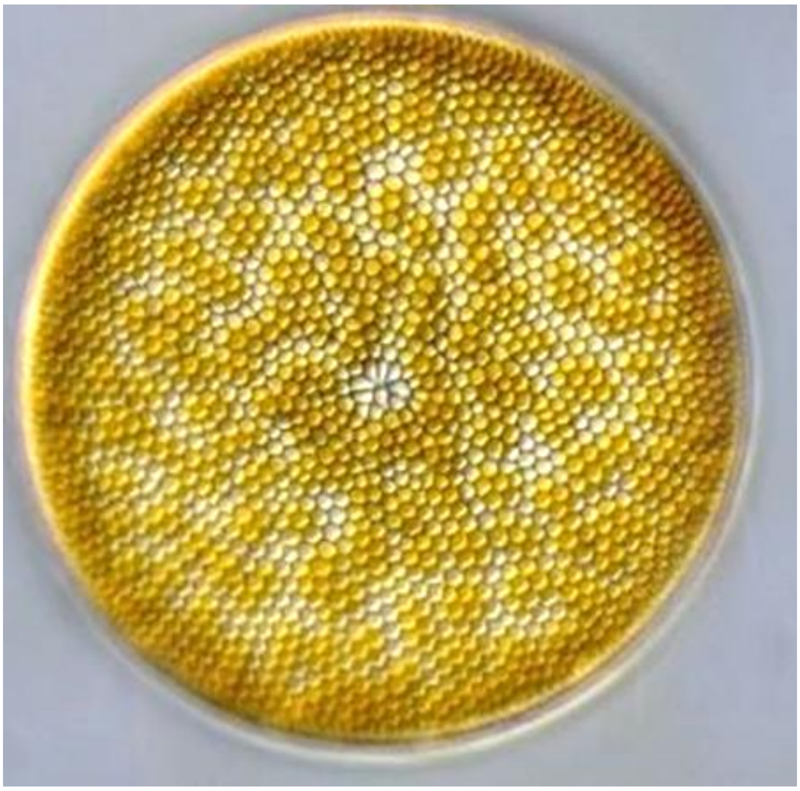
'These properties may play a direct role in improving the conditions for efficient photosynthesis in the living cells. For the organism, there is a metabolic cost associated with frustule construction, involving uptake of silica, vacuoles for transport and construction and synthesis of highly specialized proteins that are involved in the process[22]. However, the data presented here showed that the construction and **patterning of the frustule** may to some extent compensate for the costs associated with the silica cell encasement, by ***selectively enhancing propagation of optimal wavelengths and focusing the light towards the chloroplasts.'***

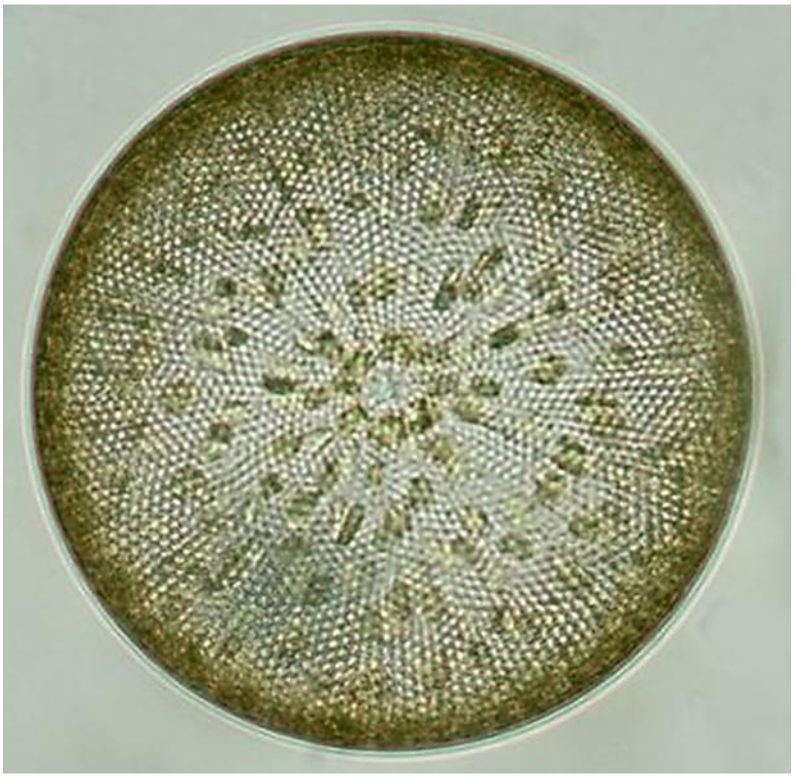
'The observed spectral changes (Fig. 2) match the maximum absorption specific to chlorophyll *a* and *c*, the two main photosynthetic pigments found in diatoms. Light absorption and photosynthesis occur in the chloroplasts and in centric diatoms such as *Coscinodiscus* the numerous, small chloroplasts are distributed towards the cell surface. From an optical point of view, this localization close to the frustule means that the chloroplasts are optically coupled to the light propagating through the biosilica structure (18). Yamanaka *et al.* (2008) suggested that *the photonic structures functioned to reduce blue light absorption*, because excessive blue light may lead to formation of reactive oxygen.'

'Optical properties of such complex structures as frustules have been studied using computational methods[11,12]. ***The symmetry of the diatom frustule structure*** can be roughly described as 1D pseudo-periodic hexagonal pattern in the radial direction, but mismatch along this direction leads to a higher order of symmetry (Fig. 1A). This 2D **sunflower-like symmetry** is also called phyllotactic spirals and the optical properties of such structures has been simulated by summation of a large number of small periodic areas arranged with ***a radial symmetry***[15].'

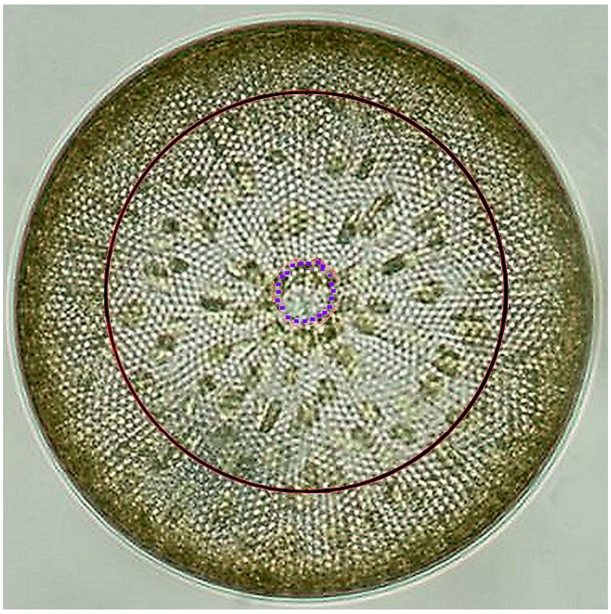
The frustule of *C. centralis*

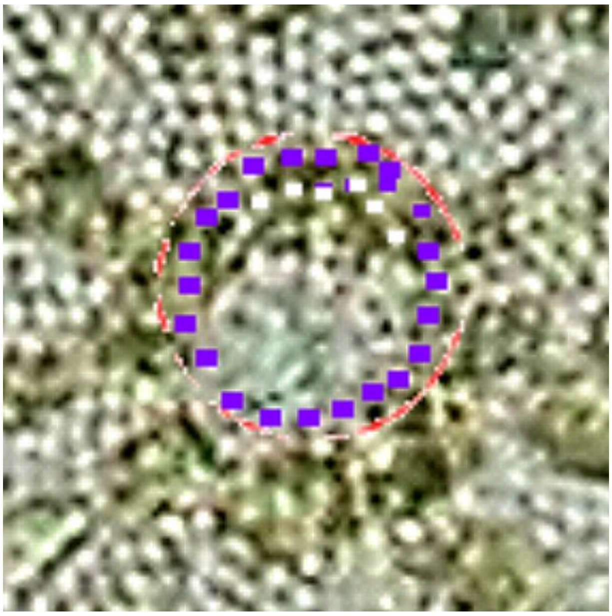
Coscinodiscus centralis - Marine Biodiversity Portal of Bangladesh



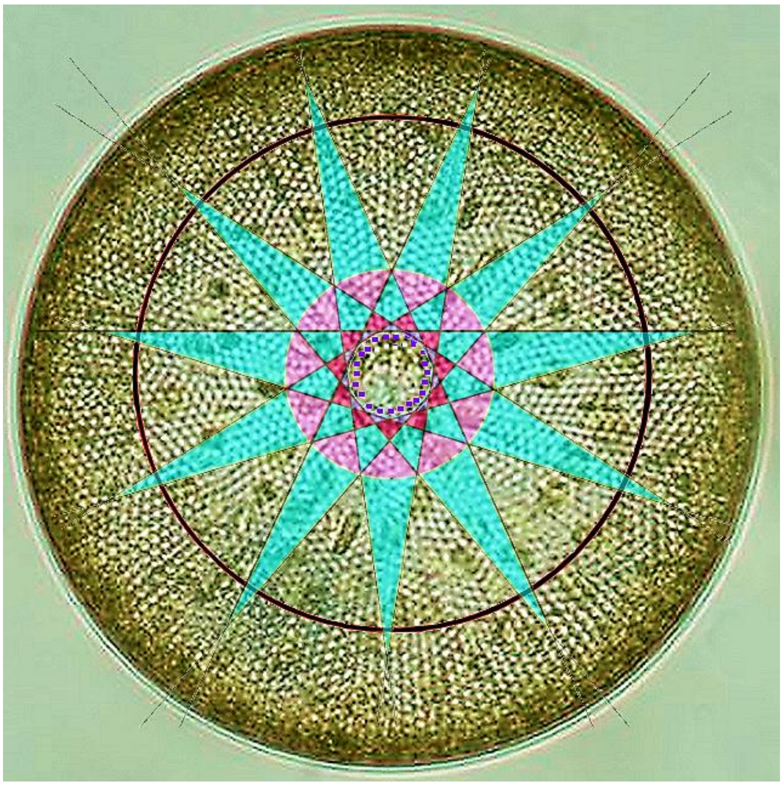


Coscinodiscus Centralis





Attempting to identify the applicable Polygram for this Coscinodiscus Centralis. The blue marks indicate possible central circles of indicators amounting to 22 or possibly 11 x 2 in phase (maintaining the Prime nature of the graphic frustule patterns of many Diatoms).



‘Based on theoretical modelling it has been suggested that frustules increase light backscattering and attenuation compared to naked cells[23]. The intensity mappings presented in this study showed a selective transmission of light from the outside to the inside of the valve (Fig. 3). Our study of the relation between incident light angle and valve orientation show some interesting features with respect to the intensity distribution of the transmitted light. The hyper-maps showed a symmetrical distribution of the transmitted light around the symmetry axis of the valve when the incoming light was normal to the valve. With the incident light tilted by an angle of about 10° we observed some clear effects. **The direction of transmitted light was unchanged, indicating that once the photons travel within the frustule they are guided by the material, independent of the angle of the incident light.** We also observed a substantial light concentration effect along the symmetry axis and the light intensity was higher on the same side as the incoming light. ***This light concentration results from a convergence phenomenon,*** in agreement with observations reported in a previous work presenting one-dimensional intensity measurements[13]. **These three effects cannot be explained by a classic diffraction phenomenon and strongly support the presence of optical waveguide properties emerging from the nanoporous structure of the valve**[15].’

‘From our measurements we see that the light was directed towards the center somewhere above the valve. Measured from the pictures in Fig. 3, the focal region is approximately 50–55 µm long and with a focusing spot about 50 µm above the valve inside. The height of the whole frustule is approximately 70 µm (Fig. 1), so the effect occurs within the height of a whole C. centralis cell and towards the opposite valve. The central part of large centric diatoms is commonly occupied by a liquid-filled vacuole, an organelle which functions in e.g. ion exchange and to maintain osmotic cell pressure. Moreover, our data indicate that light propagating to the inside of the valve is held back within the frustule (Fig. 3C). **If the alternating patterns of holes (with low refractive index) and silica structure (with high refractive index) work as a waveguide**, incoming light should be focused somewhere above the valve whereas light travelling the opposite way will be scattered. This differential effect of light modulation and transmittance from the outside to the inside (vs. from the inside to the outside) of the valve can explain the observations seen in Fig. 3D, where different orientation of the valves lead to differences in light transmission through the valve. Measurements of fluorescence from the valves verified that they were clean from organic compounds (Romann et al., submitted to Phycologia) and the apparent difference in color is probably related to the light confinement effect that happens on the interior side of the valve. For the living diatom, this effect helps to minimize the loss of light that is on the inside and increases the probability of light absorption within the chloroplasts.’

‘Albeit our data are from a single, cleaned valve in air, it is tempting to hypothesize that these effects of spectral modification, directional light concentration and light blocking effects, also occur in intact, living cells. However, in vivo experiments of living algae suspended in sea water are difficult to conduct. Indeed, the investigation of light propagation inside the frustules requires their disassembling by chemical routes leading to cell alteration and removal of organic matter from the surface. Similar observations have been made in other species of Coscinodiscus[13,14,15].’

‘The results presented here are of importance for the use of nanostructured biosilica frustules in applications, but the results also contribute to an increased biological understanding of living diatoms and what contributes to their fitness and thus ecological success. ‘

'Any potential drawbacks of synthesizing and wearing such a complex cell encasement may be compensated by the *photonic modulator properties of the frustule* that enhances light absorption and ultimately photosynthesis. We hypothesize that the *nanostructure of the frustule improves photosynthetic efficiency by focusing the light and optimizing spectral quality when passing through the frustule and by the confinement of the transmitted light in the frustule*. This hypothesis represents a new mechanism to explain the ecological and evolutionary success of diatoms. Studies on intact diatoms in water would be a logical start for further studies to shed more light – literally – on the ecological implications of diatom frustules.'

How to cite this article: Romann, J. *et al.* Wavelength and orientation dependent capture of light by diatom frustule nanostructures. *Sci. Rep.* **5**, 17403; doi: 10.1038/srep17403 (2015).

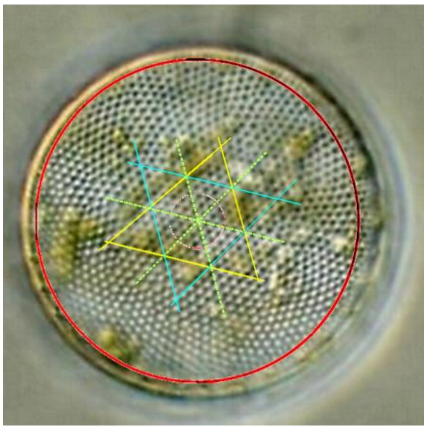
Diatom frustules **nanostructure in pelagic and benthic environments**
A Leynaert, C Fardel, B Beker, C Soler, G Delebecq… - Silicon, 2018 - Springer

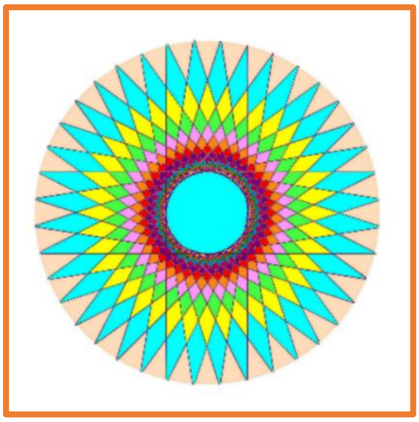
… **centric diatoms** with a radial symmetry and pennate **diatoms** … that *the structure* of the **diatom frustule** could play a role in the … In this work, we studied the variations of the **diatom frustules** …

[PDF] researchgate.net

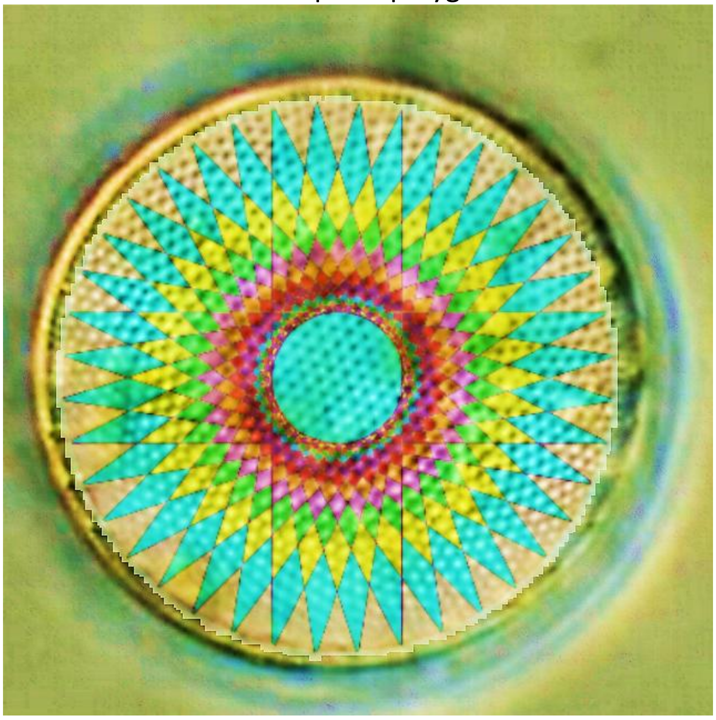
- A. Leynaert,
- C. Fardel,
- B. Beker,
- C. Soler,
- G. Delebecq,
- A. Lemercier,
- P. Pondaven,
- P. E. Durand &
- K. Heggarty

Coscinodiscus lineatus





With 40 point polygram



Because in Plane Regular Shape Theory there exists a simple but all encompassing Theorem that:

SHAPE x SHAPE = SHAPE.

And this theorem is applicable both graphically and mathematically:

And it can be extended **mathematically** to:

*A SHAPE **RATIO** x A SHAPE **RATIO** = A SHAPE **RATIO**.*

Because I have been able to display mathematically the manner in which Music Frequencies are correlated with Shape Ratios by allowing for certain harmonic *"differentials*".

And it can be extended **graphically** to:

***NESTED SHAPES** PRODUCING NEW OVERALL CIRCUMSCRIBING AND INSCRIBING CIRCLES.*

Each set of these new Circumscribing and Inscribing circles produces a further shape graphically and mathematically.

And it can be extended **Genomely** whereby:

I ATTEMPTED TO PRODUCE A 'GENOME' OF SHAPE.

My Genome of Shape is a simple list containing the shapes' Apex Degrees, Ratio, Number of Sides, and this Genome was initially set out in the order of the Apex Angles of Plane Regular Shapes.

Then I discovered that **diatomatically** my Genome of Shape could include Diatoms:

I ATTEMPTED TO INCLUDE DIATOMS IN MY 'GENOME OF SHAPE'

By identifying the Plane Regular Shapes displayed on the frustules and their forming circles and the angles producing the shapes' apexes, I was able to include them in their relevant places on my *limited* Genome of Shape which was based on the correlation of Music Frequencies with Plane Regular Shape Ratios.

Remembering:

Reluctantly:

INITIALLY MY 'GENOME OF SHAPE' WAS INTENDED TO INCLUDE ALL IDENTIFIED PLANE REGULAR SHAPES, NOT JUST THOSE THAT RESPOND TO MUSIC FREQUENCIES.

But it is notable how many Diatoms actually correspond with the Genome based on the Music Frequencies.

- Do Diatoms respond to Music?
- Would playing music to them whilst propagating them have any noticeable physical effect?
- Would playing a **specific note** to them whilst propagating have a noticeable effect?
- Could this specific note be selectable from my ***Music to Shape*** Correlation results?
- Could this specific note be selectable from my ***Music to Shape to Diatom*** Correlation results?
- Is my ***"Music to Shape to Diatom Correlation"*** an acceptable concept?
- Should it simply be called ***"Music to Diatom Correlation"?***

MY UNFINISHED SYMPHONY: A ***Music to Shape to Diatom*** Correlation Chart:

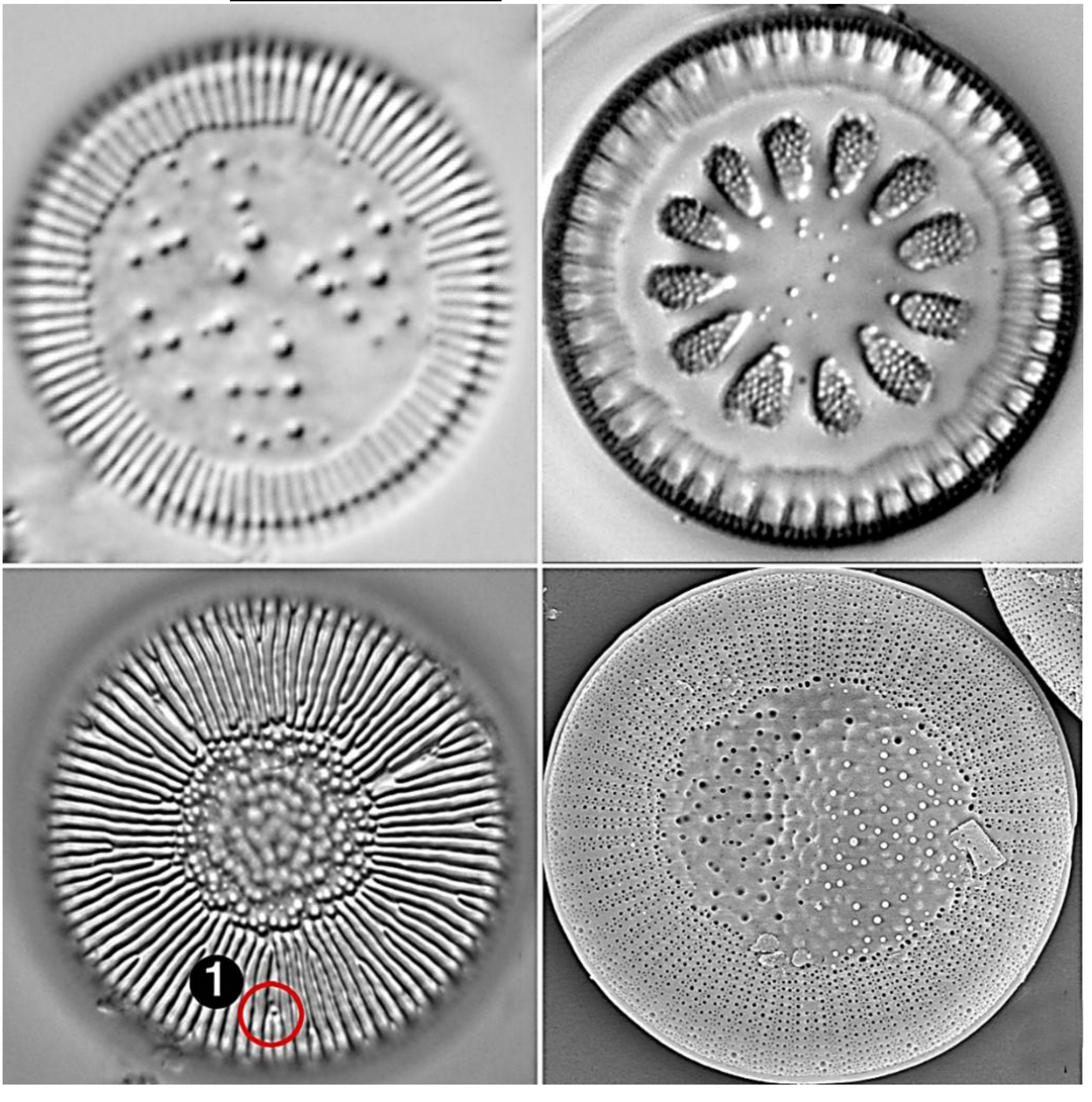
SORTED BY ⬇ | *SHAPE TO MUSIC CORRELATION* | *WITH DIATOMS*

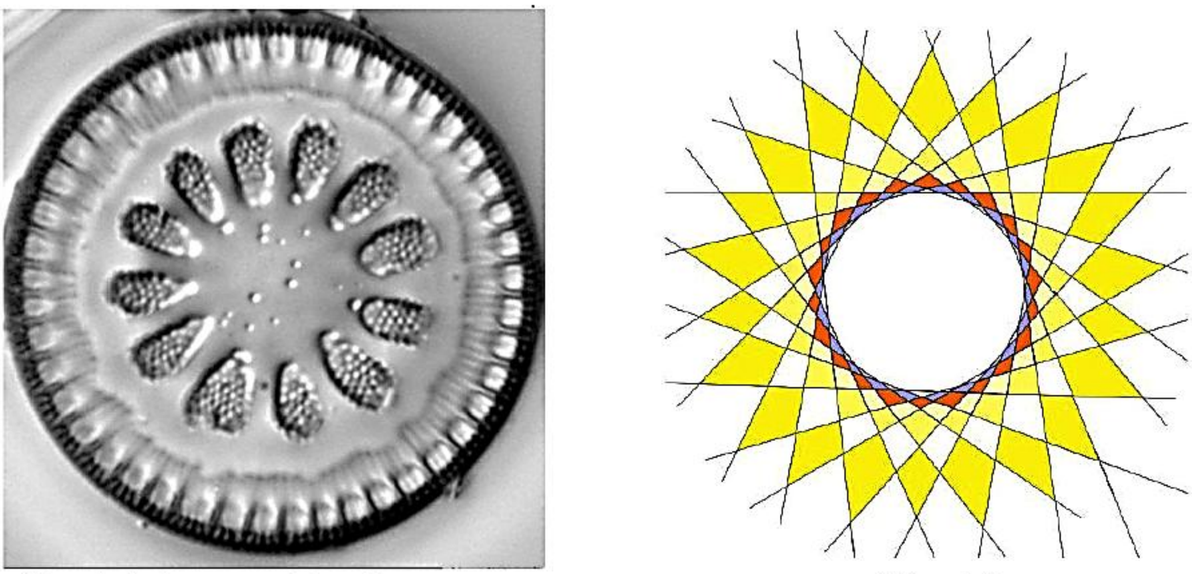
Note	Music FREQ / 100	DEGREES	SHAPE	Shape Ratios (Ratios including refined results)	*Shape Harmonic Multipliers*	*Shape / Music Differential Harmonics*	*BEST CHOICE* Shape Ratios Primary / Secondary	DIATOM & SHAPE Points	DIATOM Genus	DIATOM Species
A_2	1.100000000000000	120	Hexagon	1.154700538000000	1.080363026950910	1.049727761818180				
		118.5365854	41 pts	1.16718427						
		117	40 pts	1.167184270000000						
		116	45 pts	1.177400205000000						
		114 54545454	11 pts	1.2 approx						
		113.023255800	43 pts	1.203071672 approx						
A_2#	1.165409403795230	110	36 pts	1.211645494819790	1.059016994374940	1.039673689669900				
B_2	1.234708253140320		Pentagon	1.236067977499790	1.020156458951420	1.001101251535340				
		105.882352900	34 pts	1.253914970000000						
C_2	1.308127826503010	100	Inner Nonogram	1.309016994374940	1.059016994374940	1.000679725523690				
			13 pts	1.333333333 ?			13 pts			
		98.181818180	22 pts	1.323746919000000			22 pts			
		96	30 pts	1.36231912 approx						
C_2#	1.385913154884390	90	Square	1.414213562373100	1.080363026950910	1.020420043917590				
		83.07892308 approx	26 pts	1.491769547000000			26 pts			
D_2	1.468323839587070	84	15pts	1.497676196228630	1.059016994374940	1.019990383490480	15PT 84DEG	15 / 45 / 60	Asterolampra	Aemulans
		81.818181000	11 pts	1.509708931000000			11 pts			
		81.000000000	40 pts	1.567398119000000						
		80	18 pts	1.530733729000000						
		79.2	25 pts	1.5648						
D_2#	1.555634918610450		Golden Mean	1.618033988749890	1.080363026950910	1.040111641486670				
		75	24 pts	1.650647824000000						
E_2	1.648137784564400	72	Decagram	1.713525491562400	1.059016994374940	1.039673689669870				
		70.909090900	33 pts	1.732050808000000	√3					
F_2	1.746141157165080	70	36 pts	1.748064097795280	1.020156458951420	1.001101251535310				
		69.230769230	13 pts							
		68 deg	45 pts	1.795121951000000	estimated					
		67.50	16 pts	1.814652617150000						
		67.50	16 pts	1.847759066000000						
F_2#	1.849972113558250		60pts	1.851229586821910	1.059016994374940	1.000679725523670	60 pt	15 / 45 / 60	Asterolampra	Aemulans
		63	40 pts	1.926610162000000						
		61.9672131	61 pts	1.950308826297930						
		60.9917355	121 pts	1.960483595000000						
G_2	1.959977179908830	60	Equi Tri	2.000000000000000	1.080363026950910	1.020420043917570				
G_2#	2.076523487899830	57.073170730	41pts	2.118033988749880	1.059016994374940	1.019990383490450				
		55.862068970	29 pts	2.160726055000000			29 pts			
		54	20 pts							
A_3	2.200000000000120	52	45pts 52deg	2.288245611270730	1.080363026950910	1.040111641486640		15 / 45 / 60	Asterolampra	Aemulans
		51.428571430	14 pts	4.152370890106000						
		50	36 pts	2.380952381000000						
A_3#	2.330818807590580	49.090909090	11 pts	2.423290989639570	1.059016994374940	1.039673689669840				
B_3	2.469416506280770	48	30pts 48deg	2.472135954999580	1.020156458951420	1.001101251535290				
C_3	2.616255653006160	45	Octogram	2.613125930000000	1.059016994374940	0.998803739610628				
		43.44827586	29 pts	2.772542489						
C_3#	2.771826309768920	41.538461540	13 pts	2.828427124746190	1.080363026950910	1.020420043917540	13 IN PHASE twice	13 /26	Arachnoidiscus	Deficiens
		40	18 pts	2.936169635000000						
D_3	2.936647679174300	39.130434780	23 pts	2.995352392457270	1.059016994374940	1.019990383490430		23 /46	Arachnoidiscus	Ehrenbergii
		39.130434780	23 pts	2.995352392457270				23 /46	Melosira	Clavigera
		38.571428570	14 pts	2.724638221000000			7 / 14 / 21 pts			
		37.894736840	38 pts	3.129602235000000						
D_3#	3.111269837221060	36	Pentagram	3.236067977499770	1.080363026950910	1.040111641486610				
E_3	3.296275569128980	34	37 pts	3.427050983124800	1.059016994374940	1.039673689669820				
		34.054054000	37 pts	3.464101616000000						
F_3	3.492282314330350			3.496128195590570	1.020156458951420	1.001101251535260				
		31.764705880	17 pts	3.629305232149900						
F_3#	3.699944227116690	31	29 pts	3.702459173643810	1.059016994374940	1.000679725523610				
		30	12 pts	3.853220354000000						
G_3	3.919954359817880	29	31pts 29deg	4.000000000000000	1.080363026950910	1.020420043917510		31 pts		
		51.428571430	14 pts	4.152370890106000						
G_3#	4.153046975799880			4.236067977499750	1.059016994374940	1.019990383490400				
		27.500000000	26 pts	4.410256410000000						
		27	40 pts	4.236067978000000						
A_4	4.400000000000470		Septagram	4.576491222541460	1.080363026950910	1.040111641486580		7, 14, 28, 56, 112	Arachnoidiscus	Oamaruensis
A_4#	4.661637615181420			4.846581979279140	1.059016994374940	1.039673689669790				
B_4	4.938833012561810	23.076923080	39 pts	4.944271909999160	1.020156458951420	1.001101251535230				
C_4	5.232511306012600	22	41pts 22deg	5.236067977499760	1.059016994374940	1.000679725523590				
		20.930232560	43 pts	5.540849710000000						
C_4#	5.543652619538130	20	Nonogram	5.656854249492380	1.080363026950910	1.020420043917480	9 IN PHASE twice	9 / 18 / 36	Arachnoidiscus	Indicus / Lepidus
D_4	5.873295358348910	19.148936170	47 pts	5.990704784914500	1.059016994374940	1.019990383490370	47 prime			
		18.947369430	38 pts	6.111458184000000			19 IN PHASE twice	19 / 38		
		18	20 pts							
D_4#	6.222539674442450	16.981132080		6.472135954999560	1.080363026950910	1.040111641486560				
		16.981132080	53 pts	6.828427125000000	Octogram x Octogram		53 point polygram			
E_4	6.592551138258310			6.854101966249600	1.059016994374940	1.039673689669760				
F_4	6.984564628661070			6.992256391181140	1.020156458951420	1.001101251535210				
F_4#	7.399888454233780			7.404918347287620	1.059016994374940	1.000679725523560				
G_4	7.839908719636170	13.846153850	13 pts	8.000000000000000	1.080363026950910	1.020420043917460				
		13.75	13 / 26	8.717948714000000			13 IN PHASE twice	13 / 26		
Water Sound Image	76.8 hertz	11	49 pts	11.02040816 est.			49 pt			
		10	36 pts	16.000000000			36 pt			

COMPARING DIATOM IMAGES WITH PLANE REGULAR SHAPE IMAGES

<u>DIATOM IMAGES</u>: “Lindavia: Diatoms of the United States”
Western diatoms.colorado.edu

<u>MY SHAPE ANALYSIS</u>: 44 outer (or 2 x 22) (or 4 x 11)

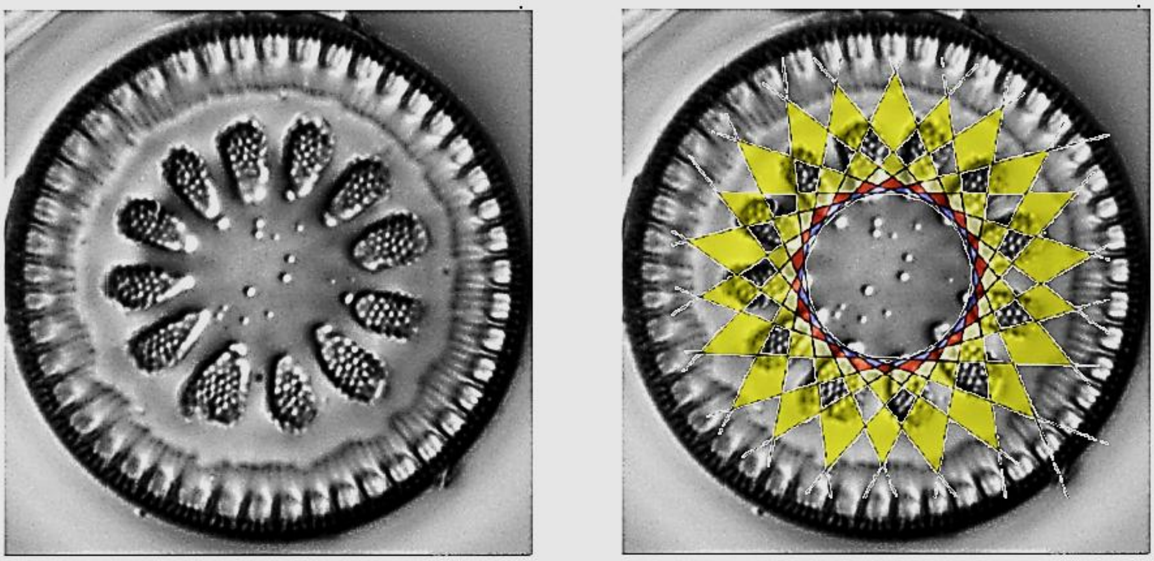




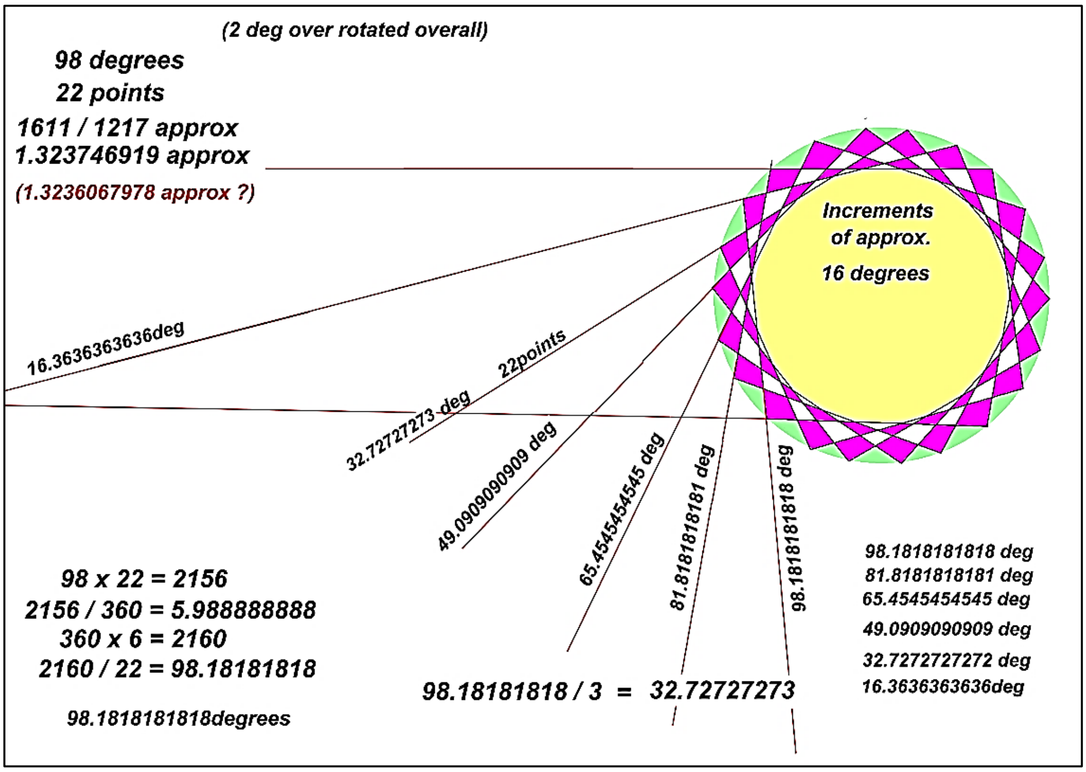
12 points inner 22 points outer 22 points

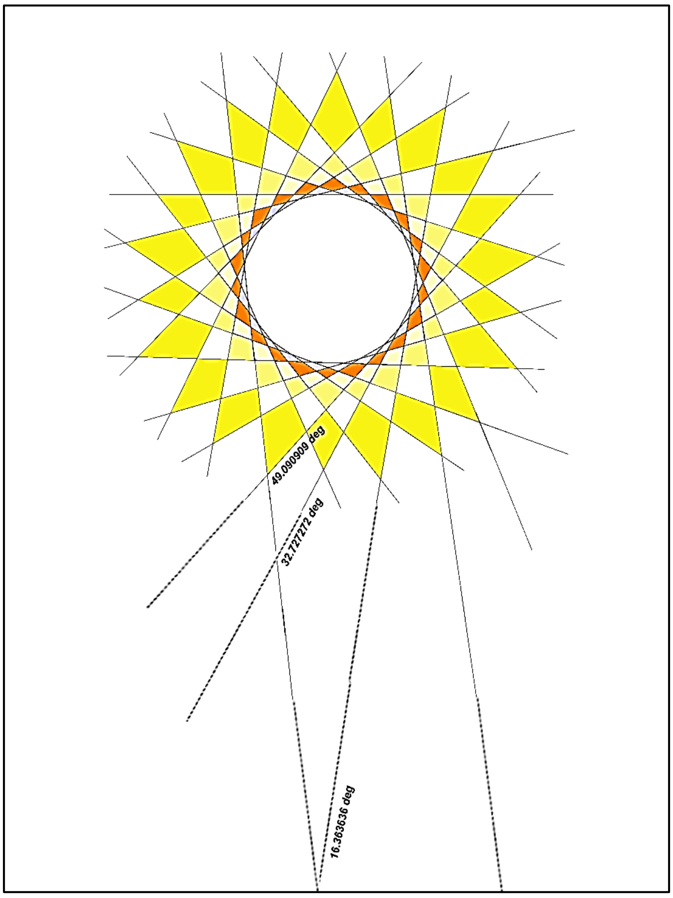
Actually, my shape is 2 x 11 points in phase and PRIME.

22 POINT DIATOM AND ITS POLYGRAM



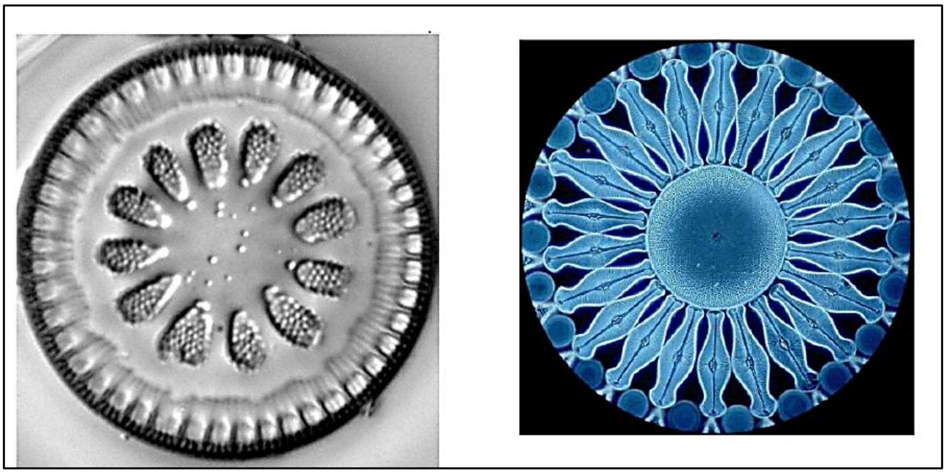
12 points inner 22 points outer 22 points

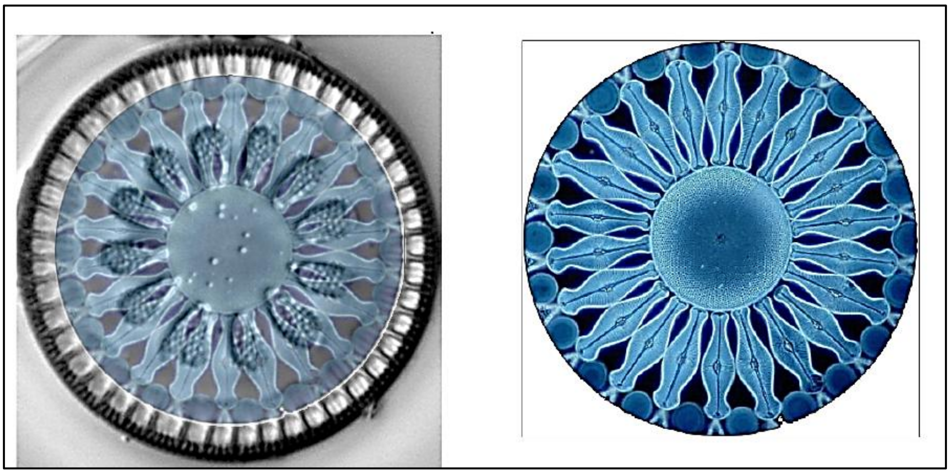




My 22 Point Polygram extended. (Or 2 x 11 points)

A COMPARISON OF TWO DIFFERENT DIATOM IMAGES.





Note how the extended formation lines in the right hand "blue" image (the bows) embrace the denticles at the outer edge of the left hand diatom image. This is an indication that the 22 point shape that is present is not a Primary 22 point polygram but is an intermediate harmonic of the primary.

How amazing that a single celled critter can be such an expert on Geometry.
Plato would have admitted it to his Academy.

How can a single celled Critter:

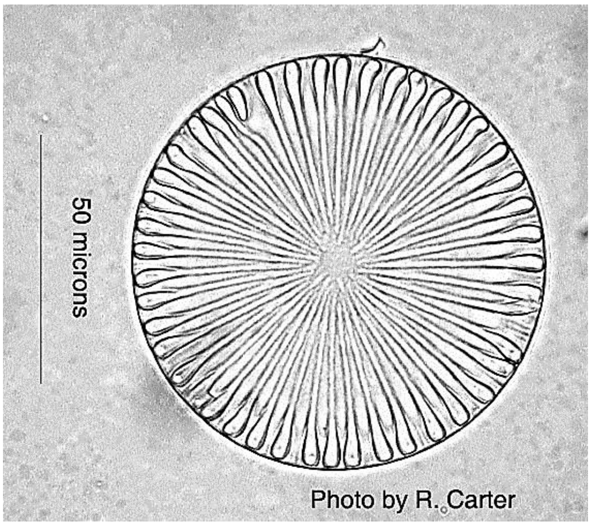
- *Know Inner Circles and their use with Outer Circles in the formation of Plane Regular Shape?*
- *Distinguish between Primary and Secondary Shapes?*
- *Know about the frequencies used to form such shapes?*
- *Know how to produce and/or access these frequencies?*
- *Know to produce the Outer denticles to indicate the presence of further harmonics?*

If they could not produce their own shapes were they then produced by some external force or factor?

Mic-UK: Oamaru Diatoms

Microscopy-UK566 × 500

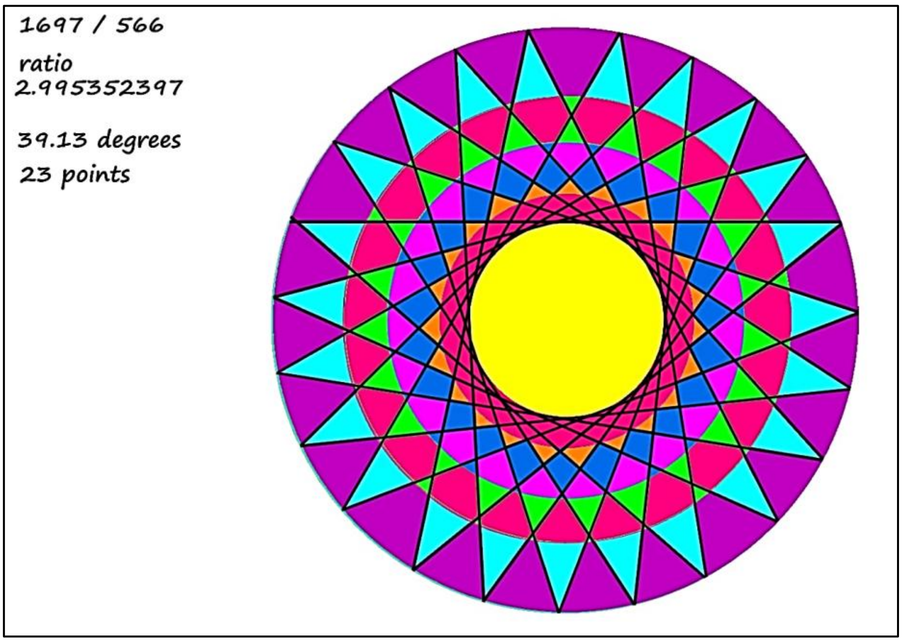
Melosira clavigera Grunow in Van Heurck. Papakaio, Oamaru. Mounted by Dr. Charles L. Odam, November 1945. Ex. Collection of F. C. Wise



46 points or 2 x 23 points in phase (prime).

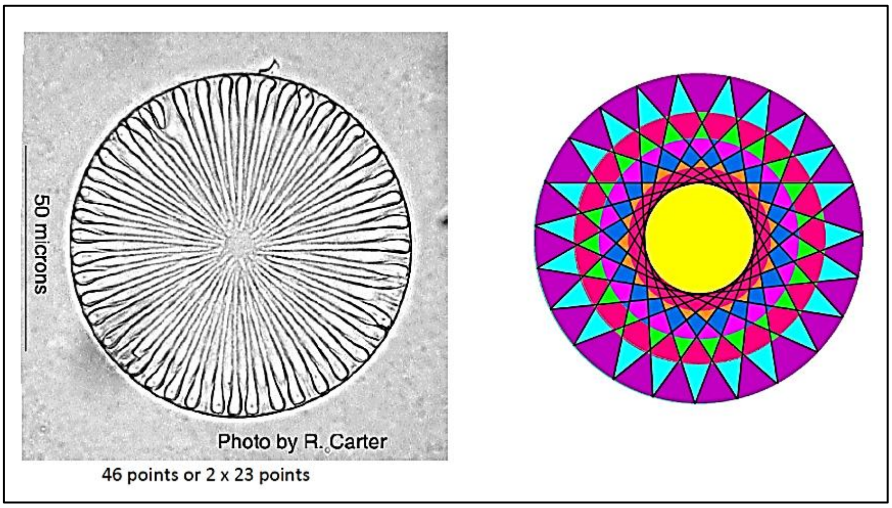
Note the Circle formed by the short sides of the "petals".It is subtle but still present.

23 point polygram - PRIME



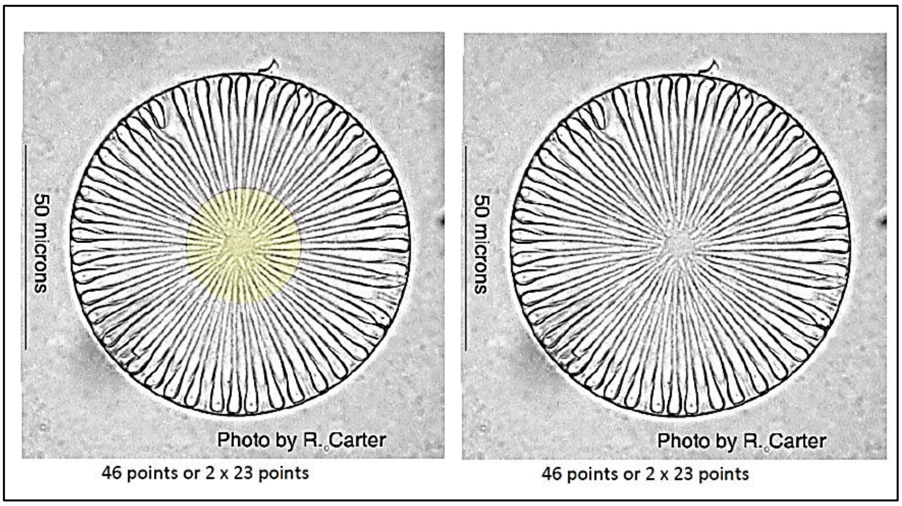
MY MUSIC TO SHAPE TO DIATOM CORRELATION:

Note	Music FREQ / 100	DEGREES	SHAPE	Shape Ratios Ratios including refined results	*Shape Harmonic Multipliers*	*Shape / Music Differential Harmonics*	DIATOM & SHAPE Points	DIATOM Genus	DIATOM Species
D_3	2.936647679	39.130434780	**23 pts**	2.995352392	1.059016994	1.019990383	23 / 46	Arachnoidiscus	Ehrenbergii
							23 / 46	Melosira	Clavigera

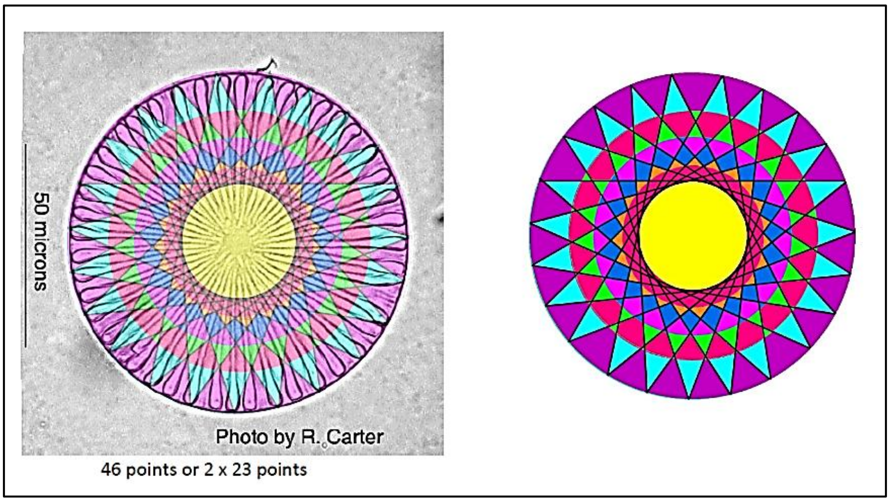


46 POINT DIATOM 23 POINT PLANE REGULAR SHAPE

OR 1 X PRIME 23 POINTS IN PHASE Twice

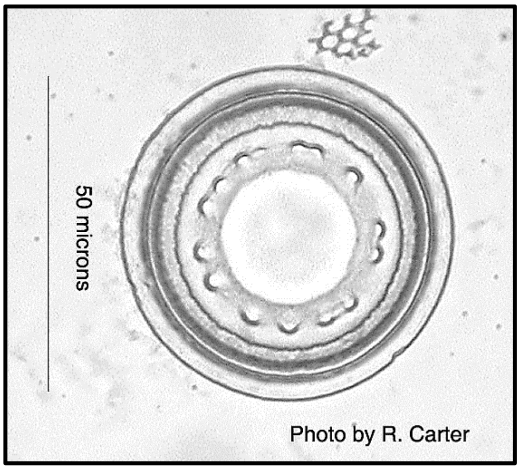


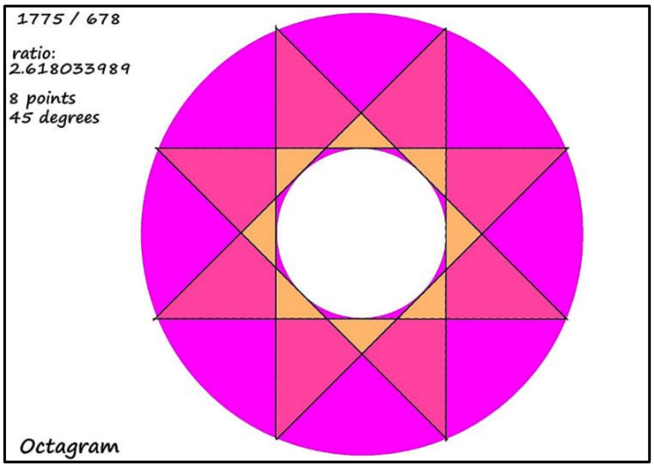
NOTE THE INFERRED INNER AND INTERMEDIATE CIRCLES DISPLAYED ON THE DIATOM.

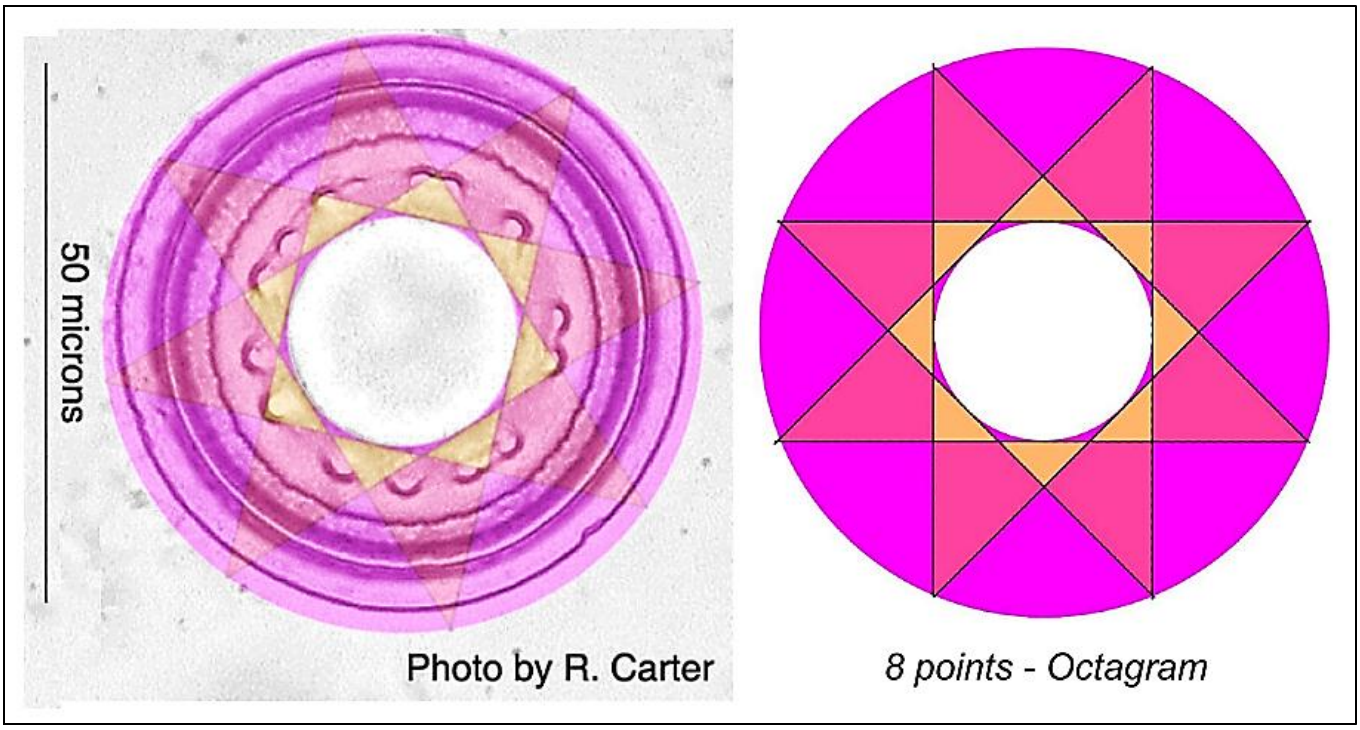


WITH THE SHAPE SUPERIMPOSED OVER THE DIATOM IMAGE

8 POINTS – OCTOGRAM

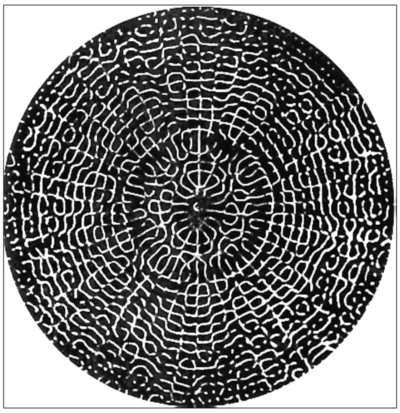


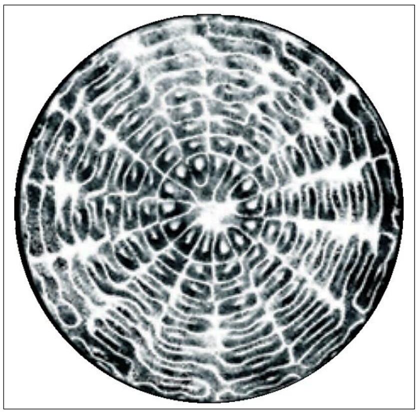




THIS EXERCISE INDICATES THE RELEVANCE OF THE DIATOM’S INNER TO ITS OUTER CIRCLES.

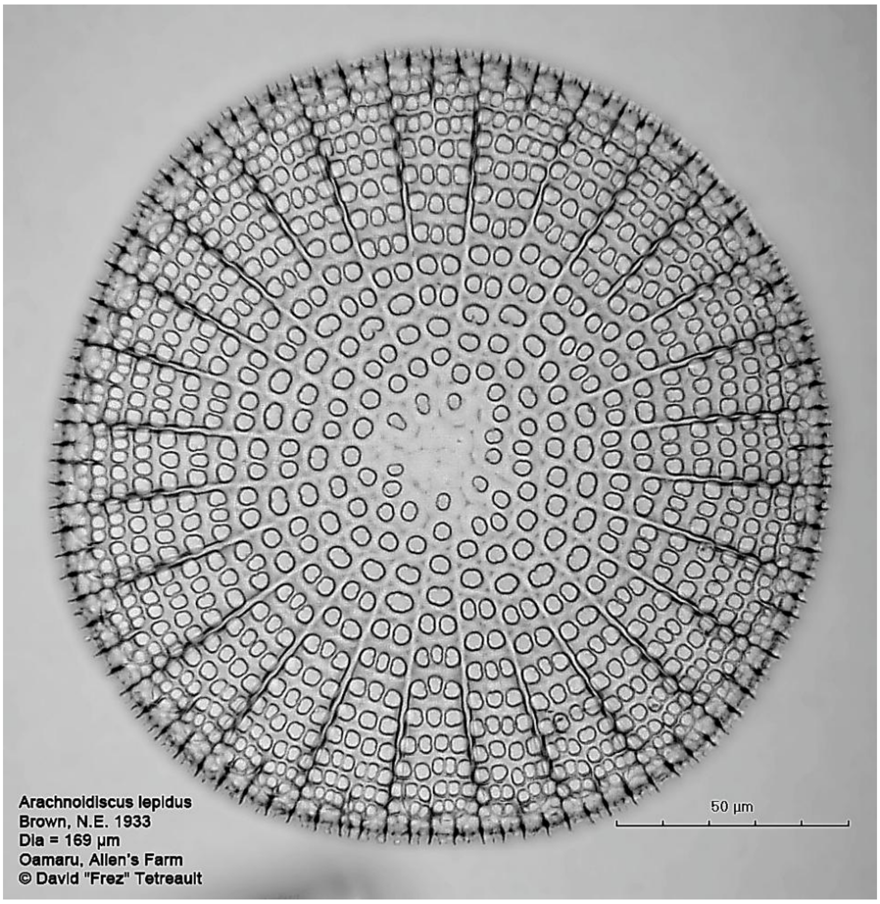
JENNY'S CYMATICS IMAGES:





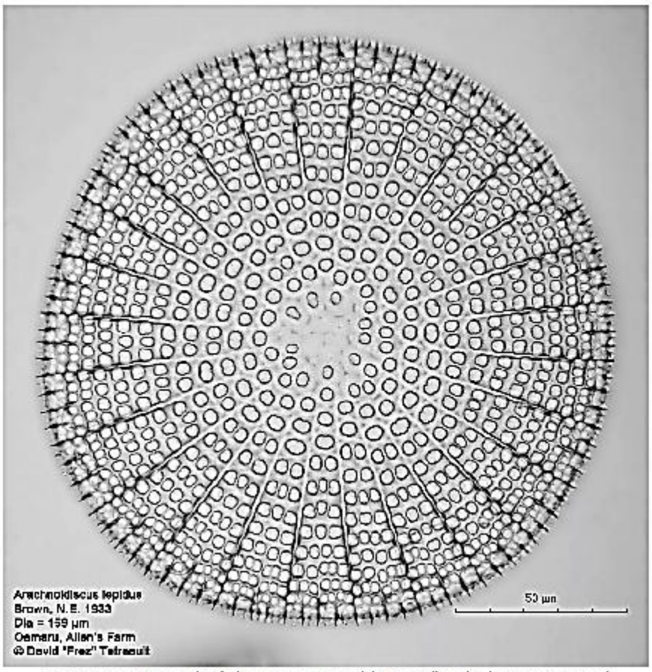
Frezmicro's most interesting Flickr photos | Picssr

ARACHNOIDISCUS LEPIDUS

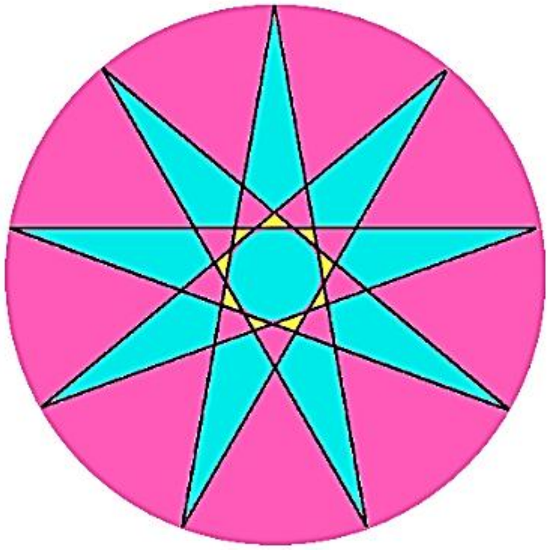


9 x 3 = 27 points or segments - Options: 27 / 54 / 108 / 216
(Or 27 x 4 = 108 points) (216 small circles exist at outer)

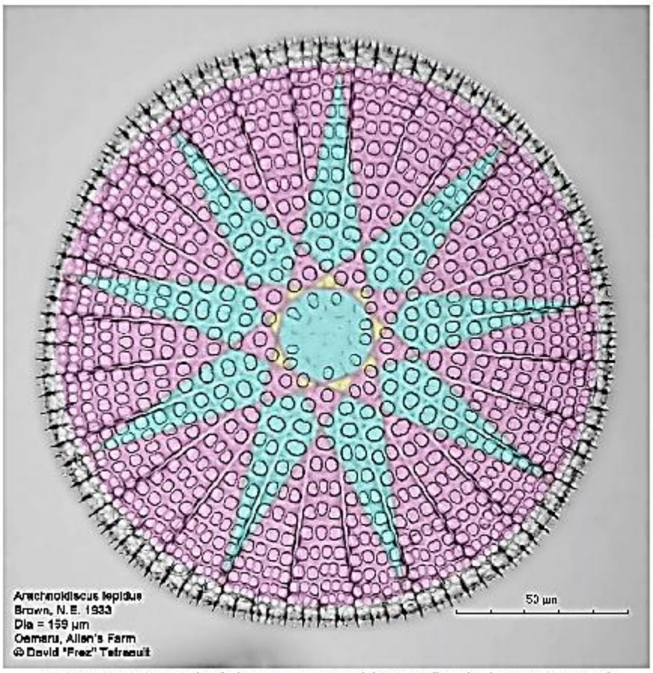
Note	Music FREQ / 100	DEGREES	SHAPE	Shape Ratios Ratios including refined results	*Shape Harmonic Multipliers*	*Shape / Music Differential Harmonics*	DIATOM & SHAPE Points	DIATOM Genus	DIATOM Species
C_4#	5.543652620	20	Nonogram	5.656854249	1.080363027	1.020420044	*9 IN PHASE twice*	9 / 18 / 36	Arachnoidiscus Lepidus



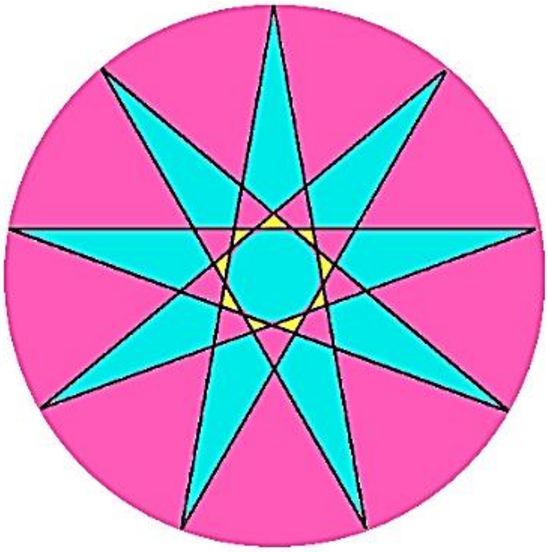
27 points or segments (and plus x4 = 108 points) (216 small circles between at outer)
27 / 54 / 108 / 216



9 points - Nonogram



27 points or segments (and plus x4 = 108 points) (216 small circles between at outer)
27 / 54 / 108 / 216



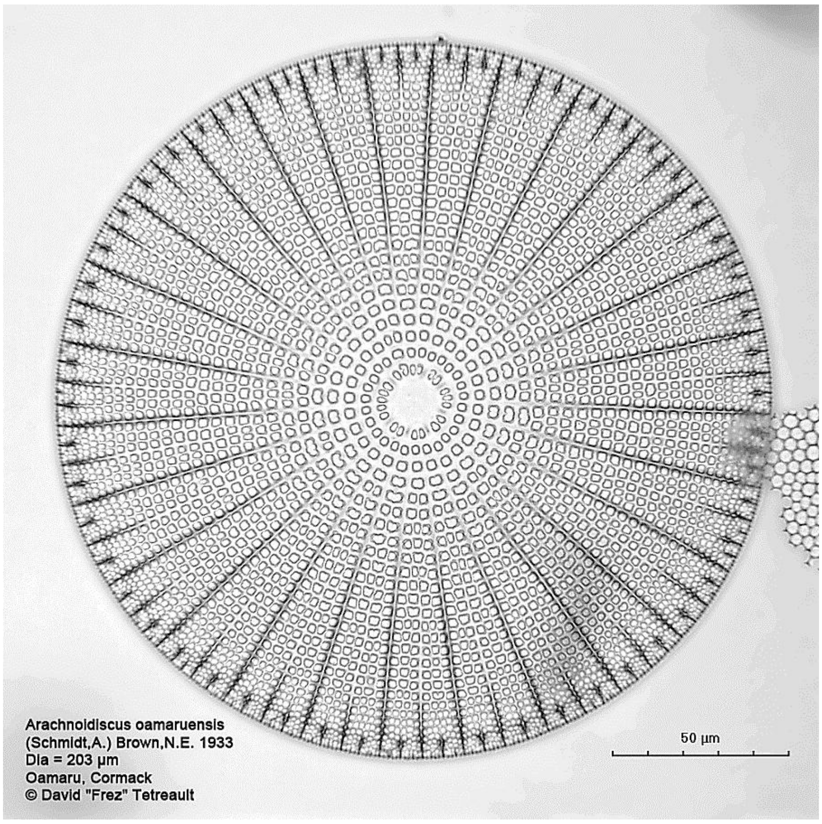
9 points - Nonogram

This Nonogram seems to be a perfect fit inferring that the 27 points are made up from
3 Nonograms in phase.

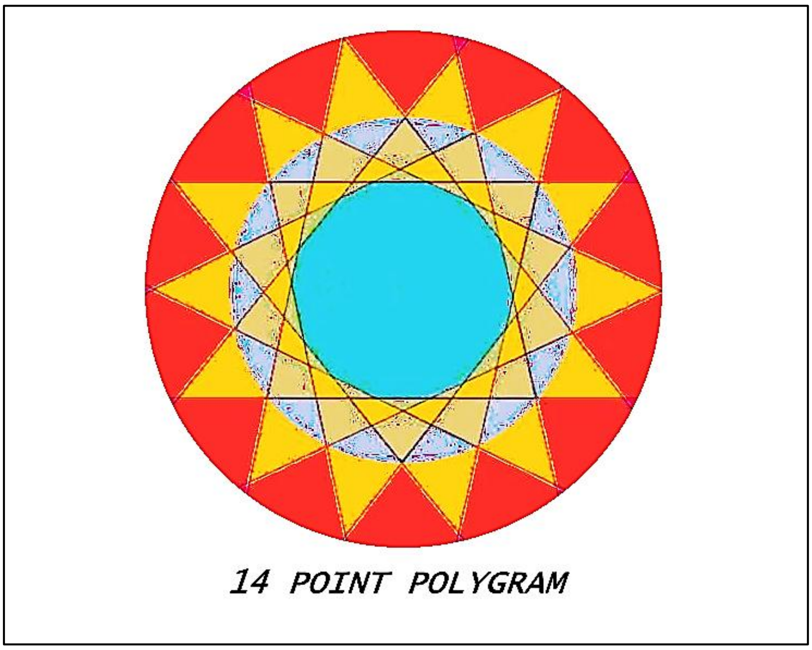
Coscinodiscus oamaruensis

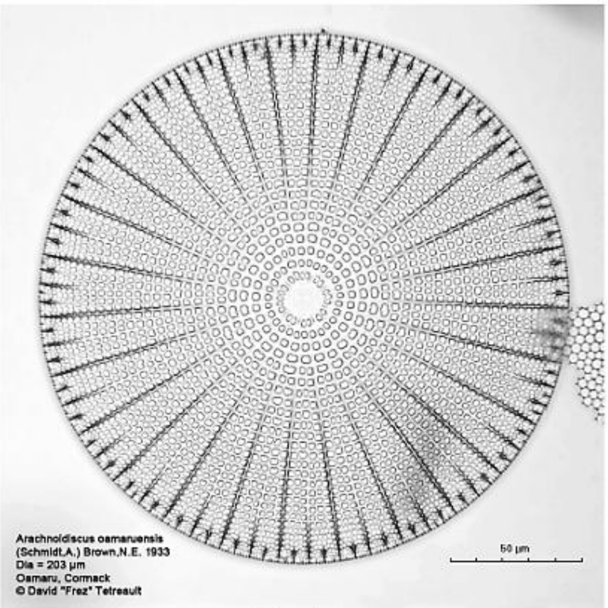
Arachnoidiscus oamaruensis (Schmidt, A.) Brown, N.E. 1933 B&L 40x FL Diatom

Note the inferred Inner Circles. The Radial Lines cease at these Inner Circles.

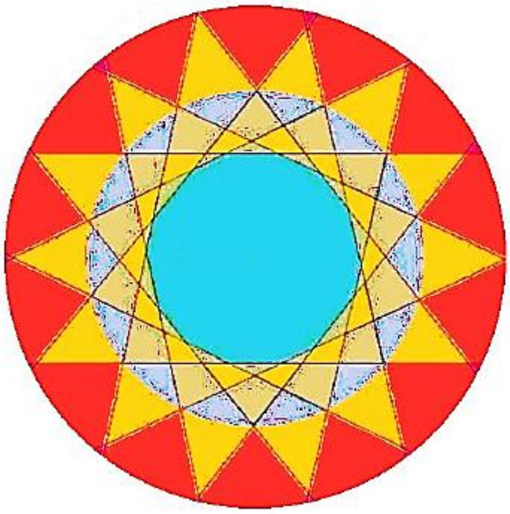


28 points
7 / 14 / 28 / 56 / 112

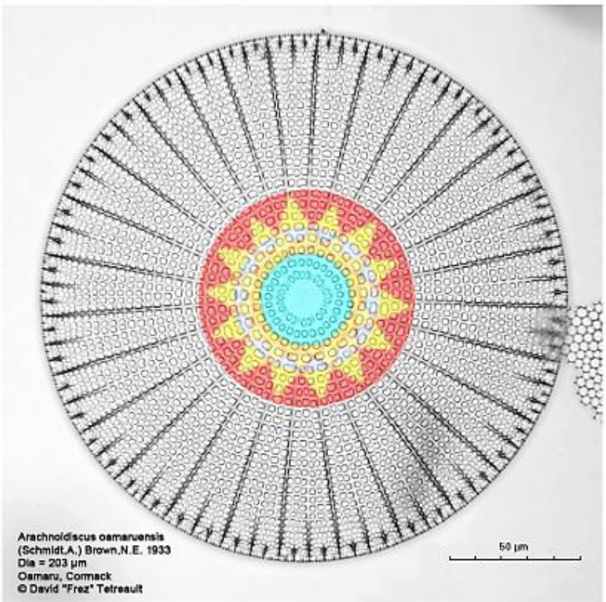




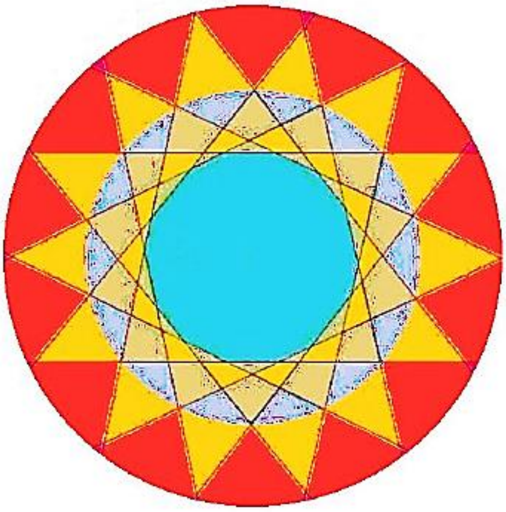
28 points
7 / 14 / 28 / 56 / 112



14 POINT POLYGRAM



28 points
7 / 14 / 28 / 56 / 112



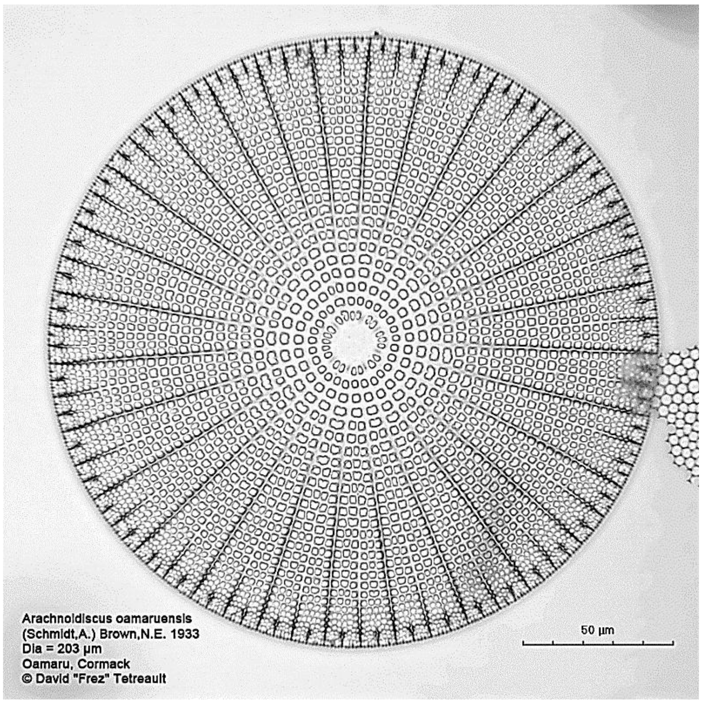
14 POINT POLYGRAM

COMPARING A DIATOM WITH A LAUTERWASSER CYMATICS PHOTOGRAPHIC IMAGE

Coscinodiscus oamaruensis

DIATOM IMAGE CIRCLES

Note the inferred Inner Circles. The Radial Lines cease at these Intermediate Circles.



28 points or 7 / 14 / 28 / 56 / 112 if they are Shapes in Phase (or even 49).

LAUTERWASSER'S IMAGE CIRCLES:

Note the inferred Inner Circles. The Radial Lines cease at these Intermediate Circles.

Figure 11 – Water-Sound-Image, 76.8 Hertz.

USING MY ILLUSTRATION OF A 49 POINT POLYGRAM WITH 11 DEGREES IN EACH POINT:

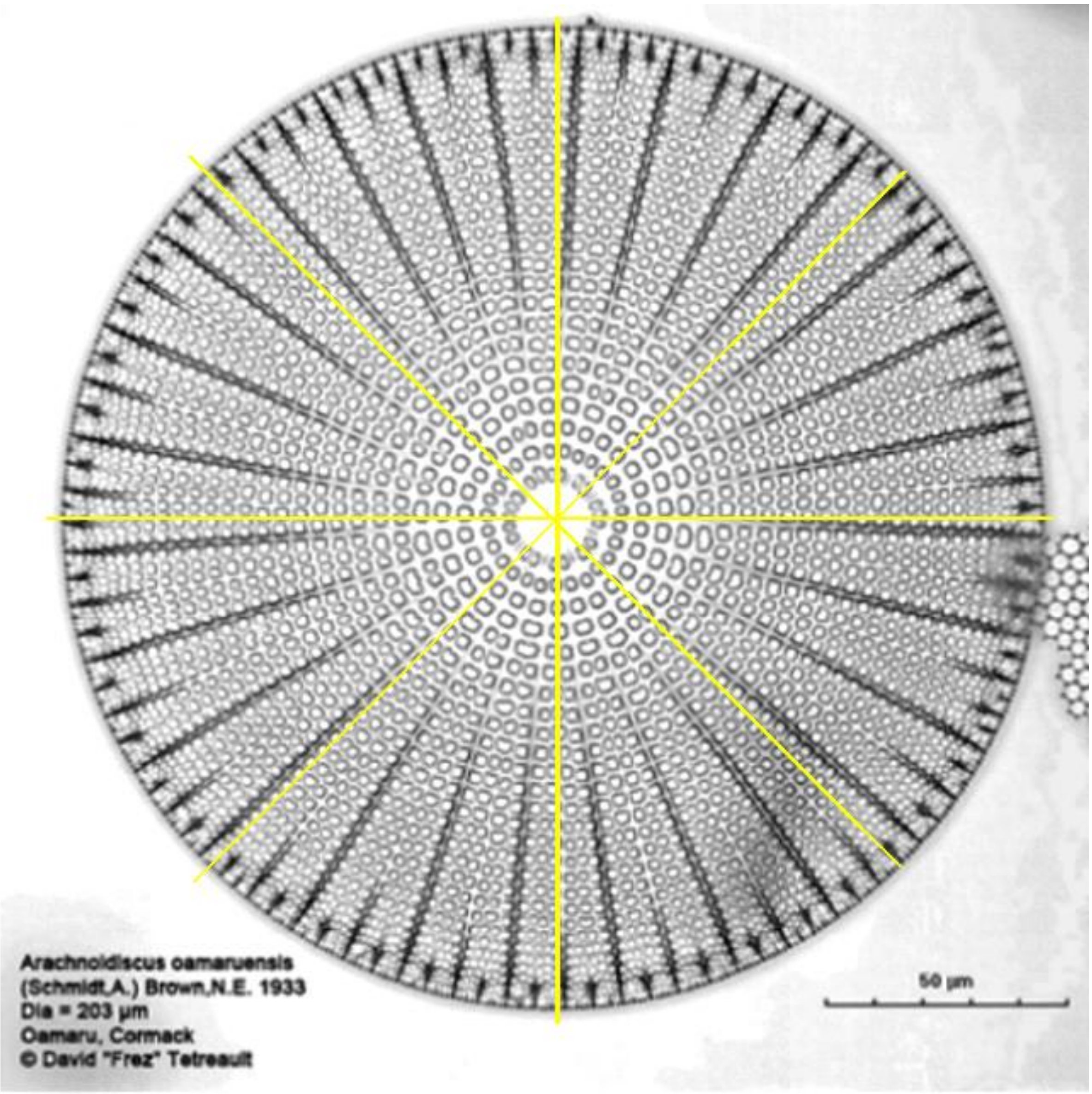
Figure 11 – Water-Sound-Image, 76.8 Hertz.

49 points 11 degrees ratio 11.02040816est

NOTE HOW THE CIRCLES ARE APPLICABLE TO THE INTERSECTIONS OF ALL CONSTRUCTION LINES IN THIS POLYGRAM.

MORE ACCURACY IN PRODUCING POLYGRAMS WOULD ONLY ENHANCE THIS OBSERVATION.

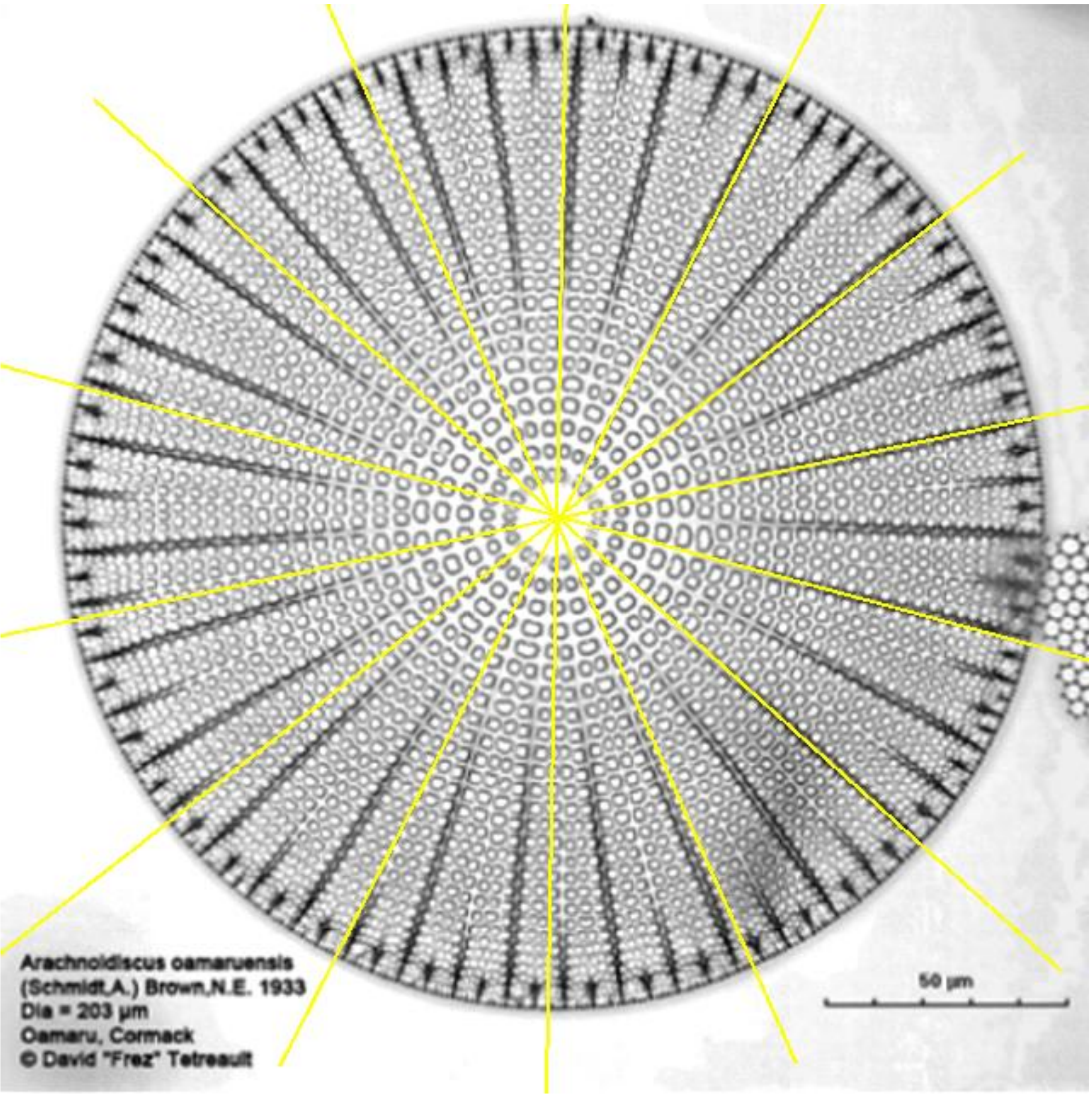
Coscinodiscus oamaruensis
Arachnoidiscus oamaruensis



Radials rotated at 45^0.

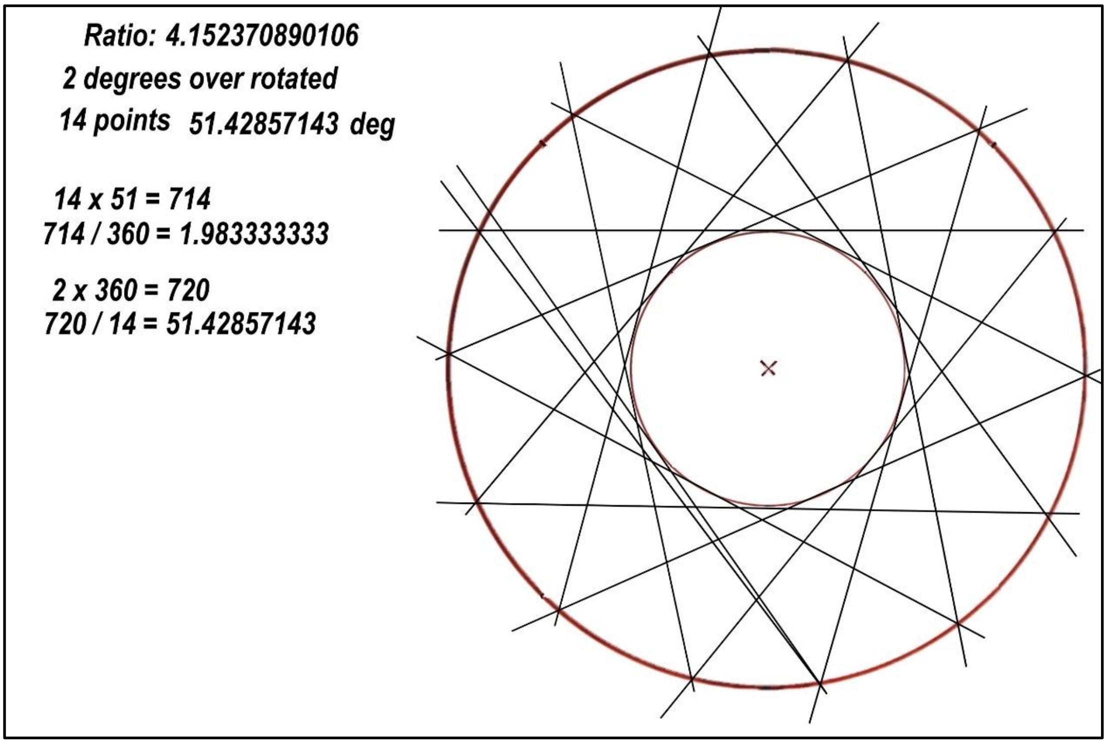
7 pointed star requires about 51.43^0.

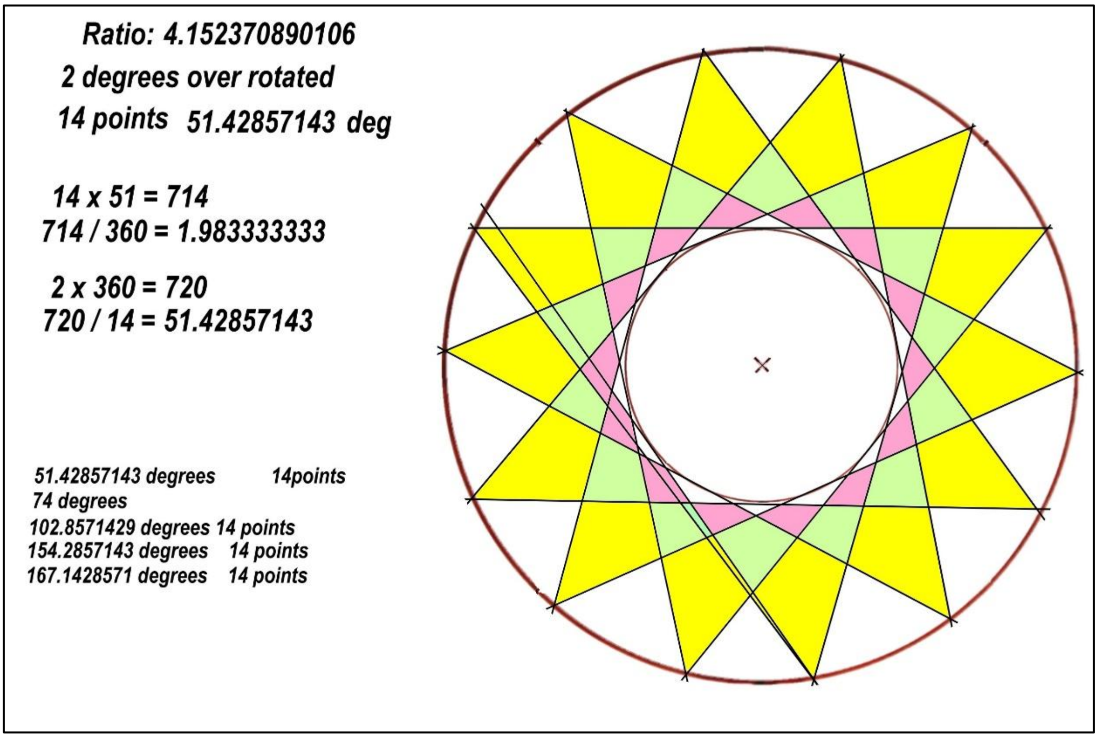
Coscinodiscus oamaruensis
Arachnoidiscus oamaruensis



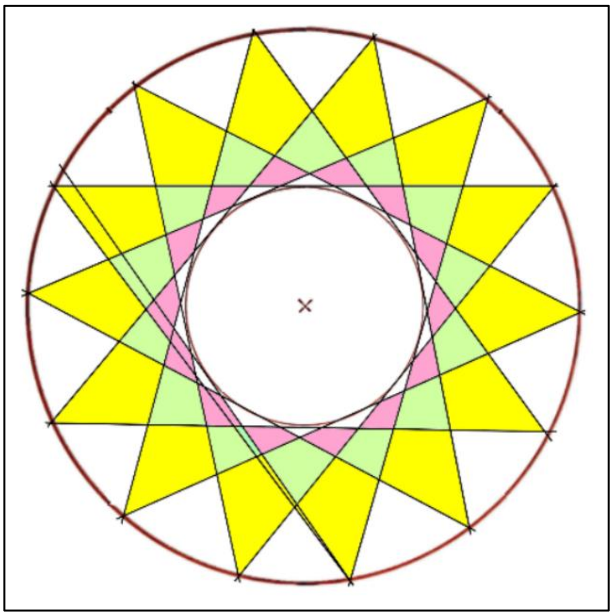
Radials rotated at about 51.43^0.

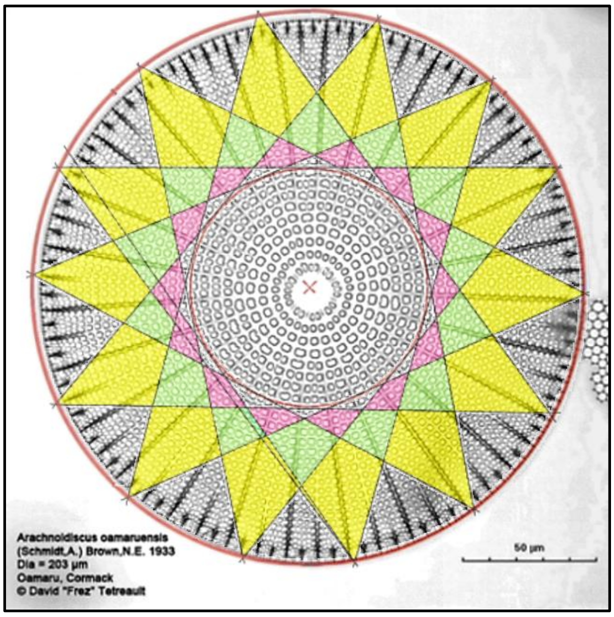
14 pointed star requires about 51.43^0.

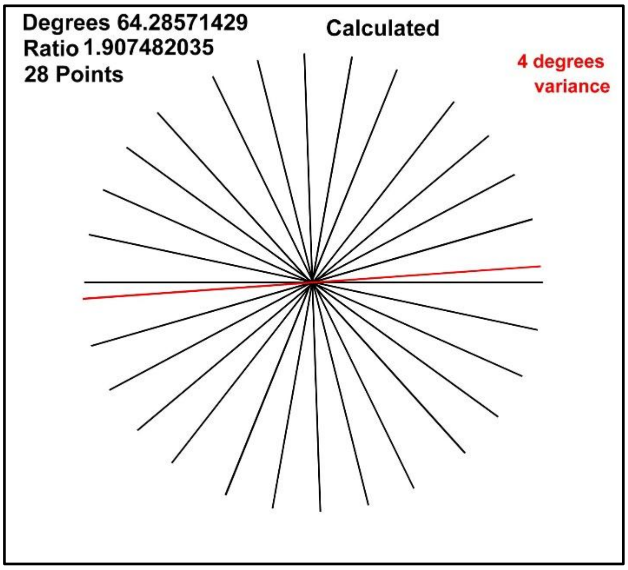

Ratio: 4.152370890106
2 degrees over rotated
14 points 51.42857143 deg
14 x 51 = 714
714 / 360 = 1.983333333
2 x 360 = 720
720 / 14 = 51.42857143

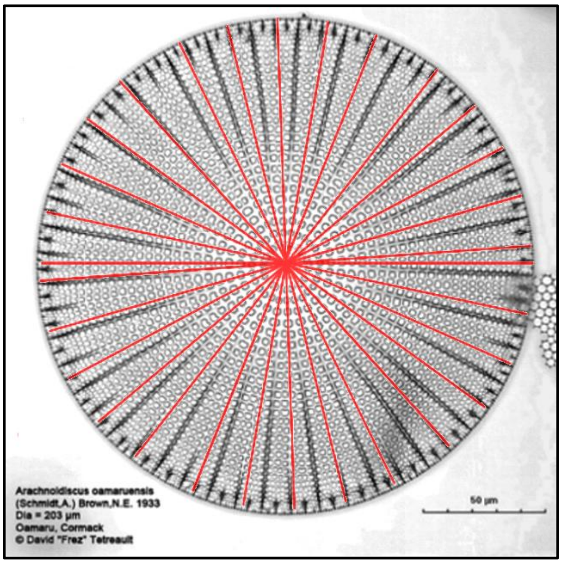

Ratio: 4.152370890106
2 degrees over rotated
14 points 51.42857143 deg
14 x 51 = 714
714 / 360 = 1.983333333
2 x 360 = 720
720 / 14 = 51.42857143
51.42857143 degrees 14points
74 degrees
102.8571429 degrees 14 points
154.2857143 degrees 14 points
167.1428571 degrees 14 points

Coscinodiscus oamaruensis

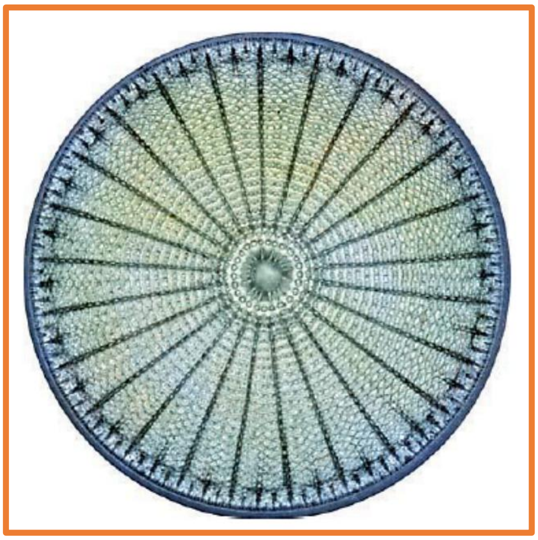


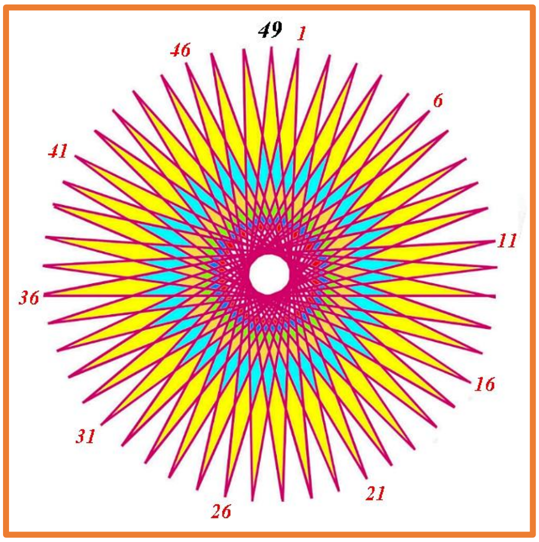


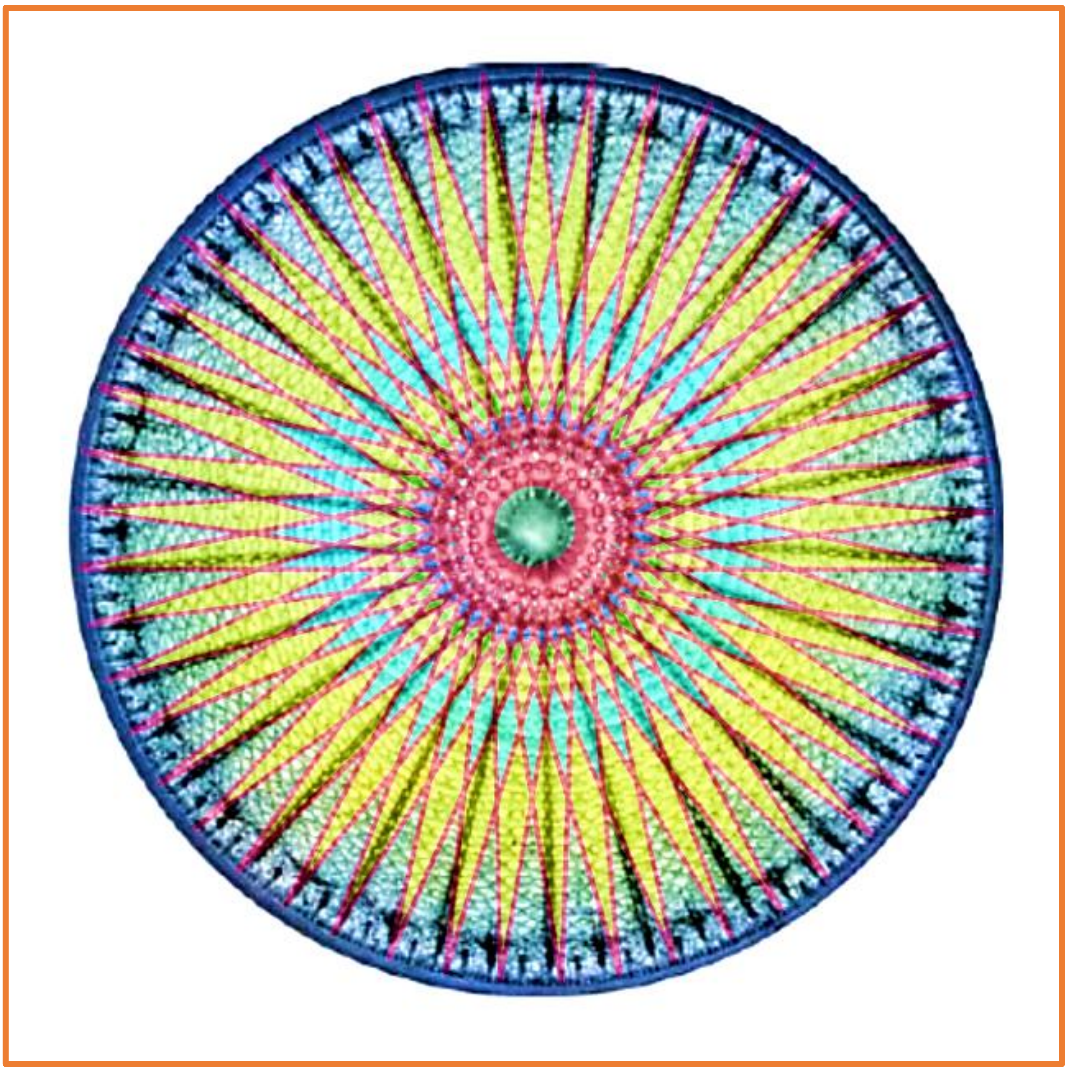


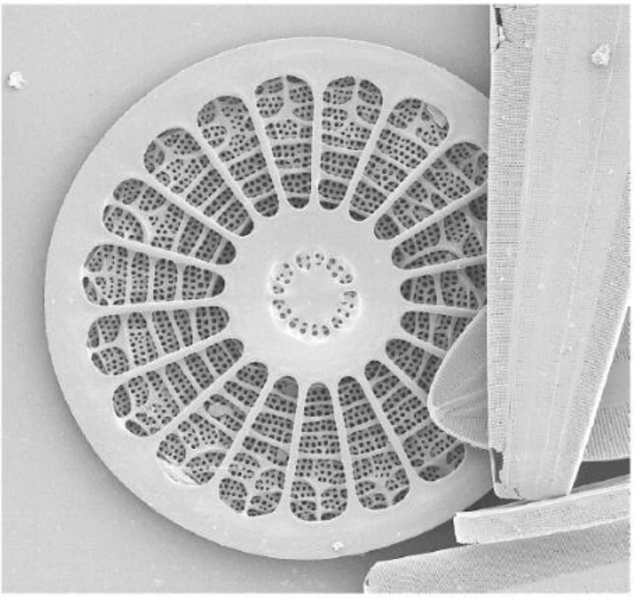


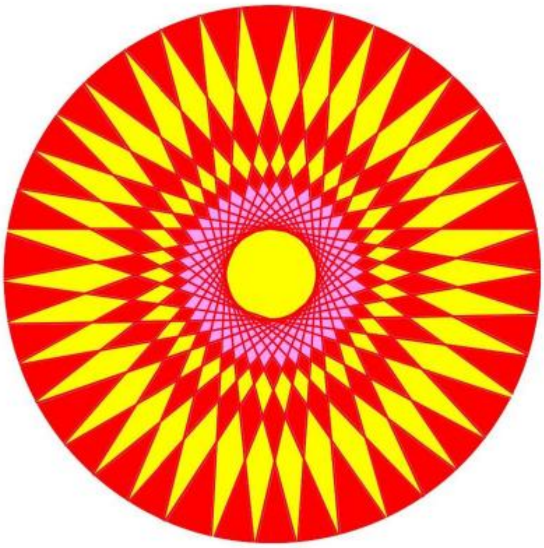
49 POINT DIATOM AND POLYGRAM
OR 7 X 7 IN PHASE PRIME



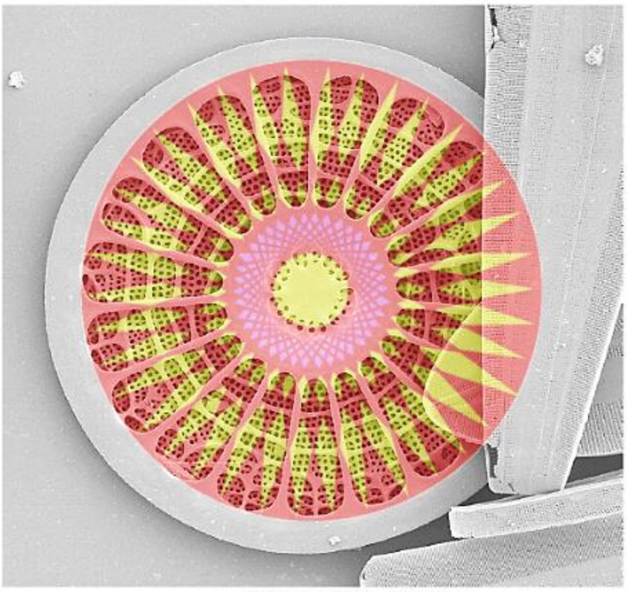


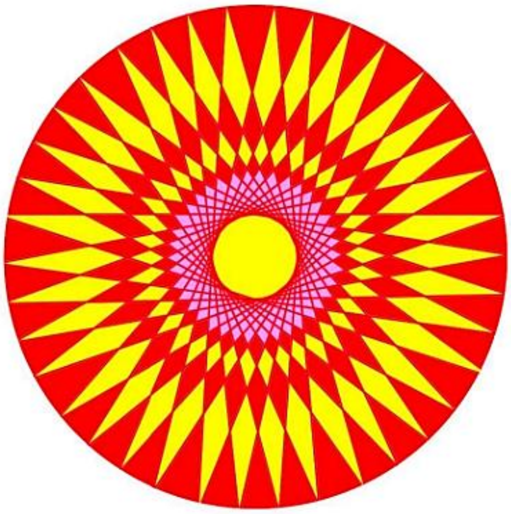






19 / 38 points ***19 degrees*** ***(18.94736842 degrees)***

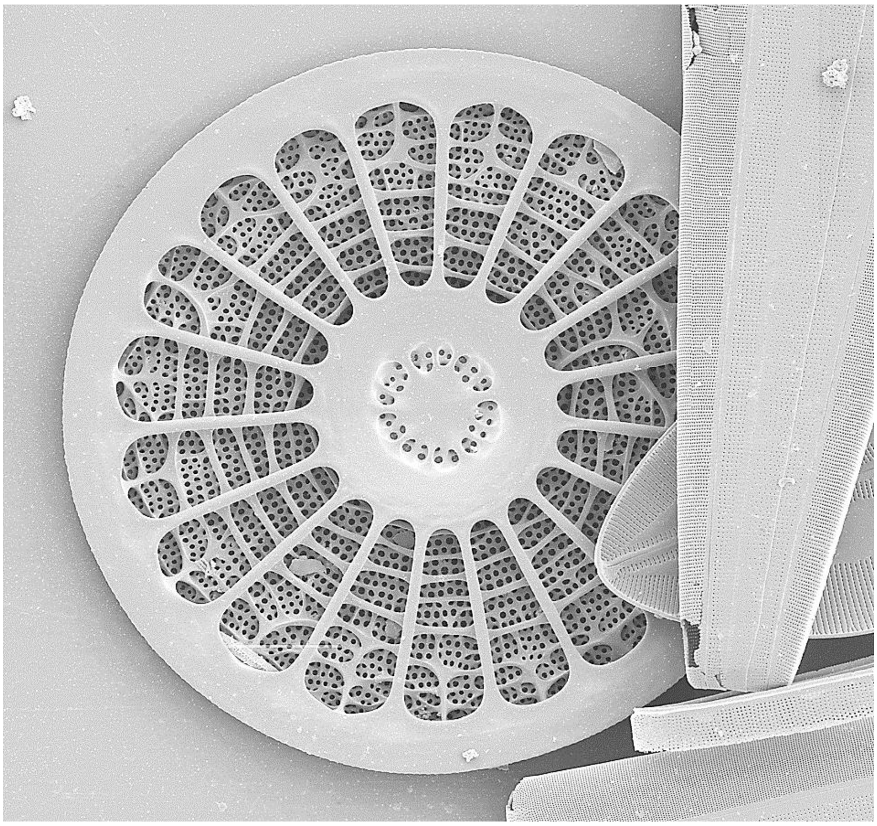




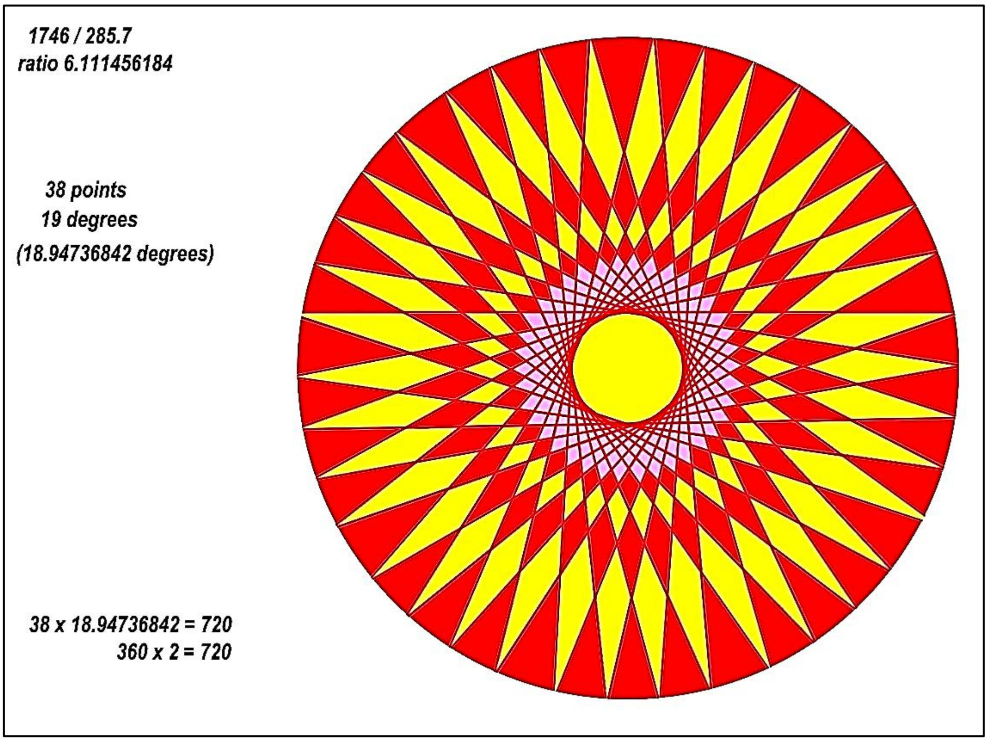
19 / 38 points ***19 degrees*** ***(18.94736842 degrees)***

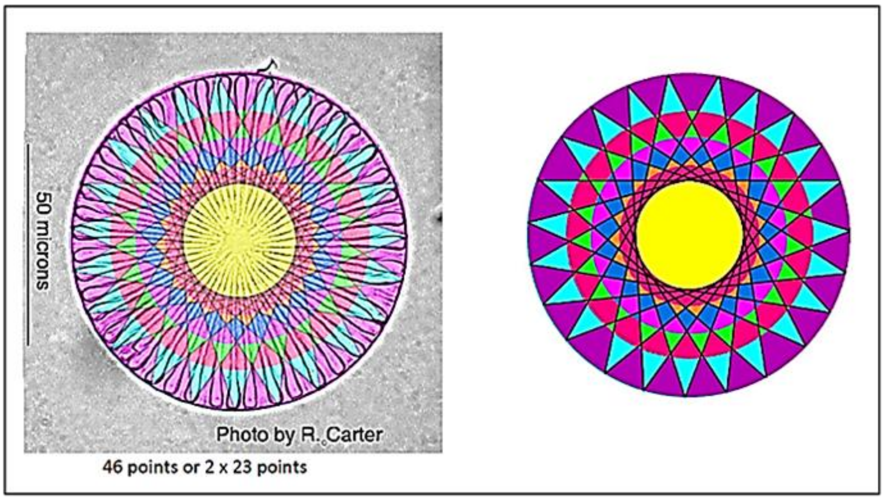
[ITG : Imaging Technology Group: Image of the Week: November 17, 2009](itg.beckman.illinois.edu)

[itg.beckman.illinois.edu 953 × 894](itg.beckman.illinois.edu)

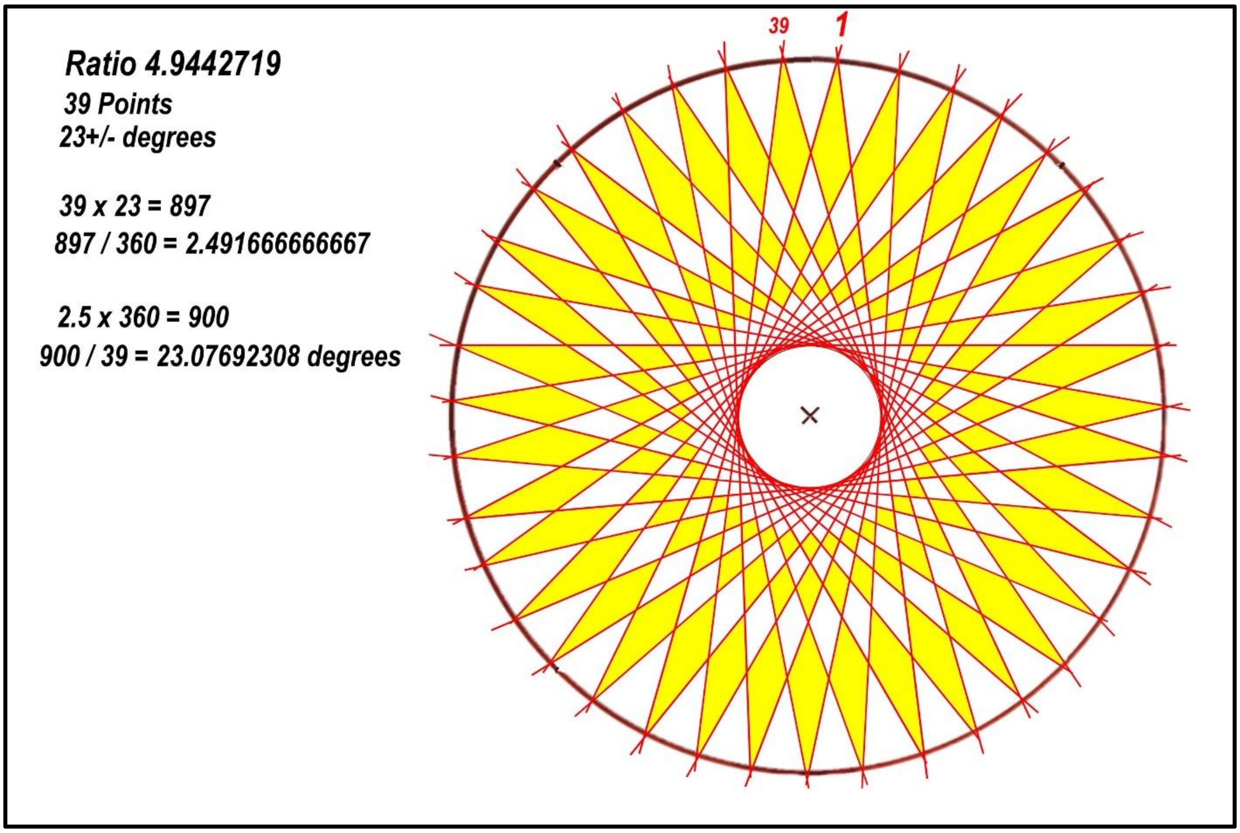


19 / 38 points

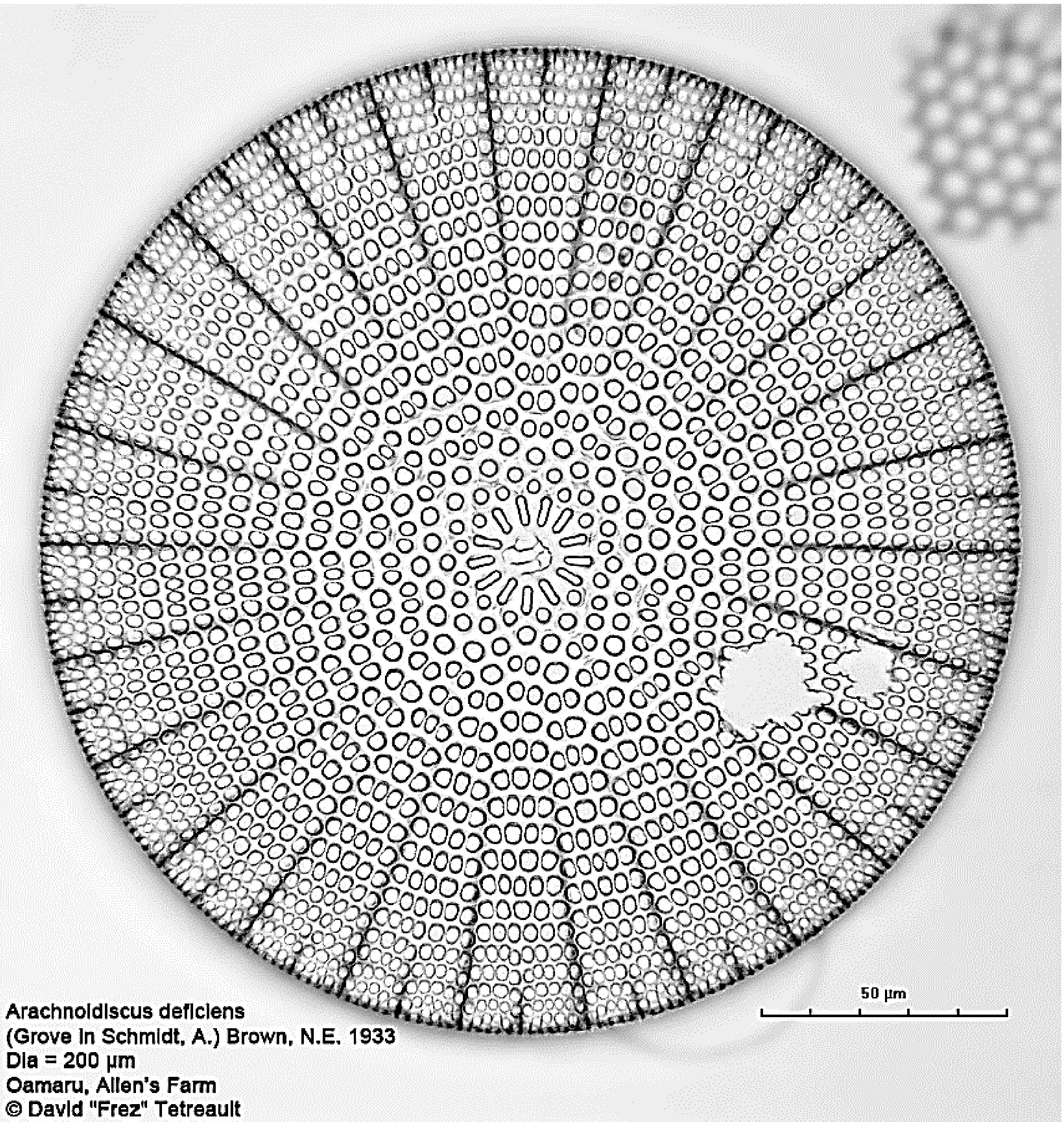




WITH THE SHAPE SUPERIMPOSED OVER THE DIATOM IMAGE



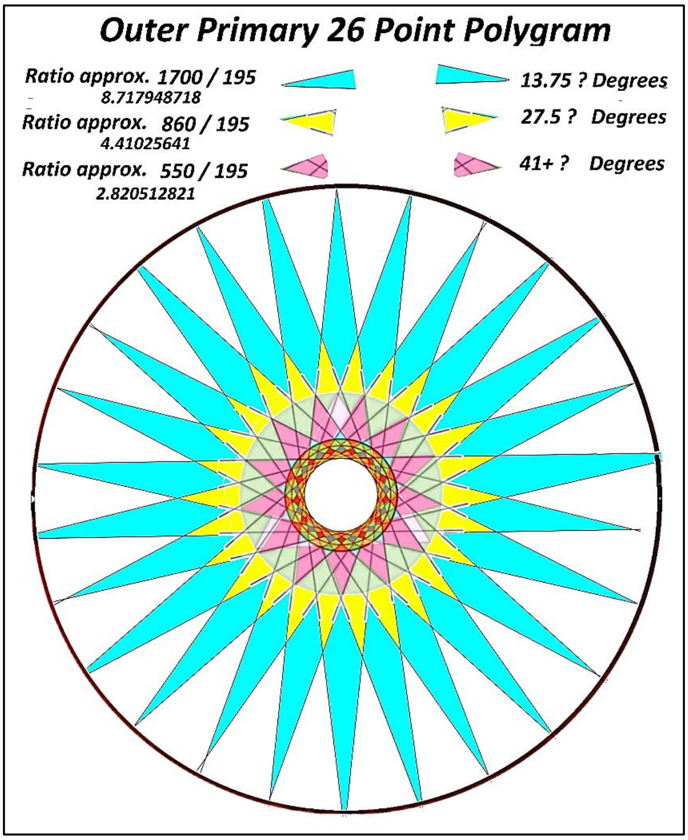
ARACHNOIDISCUS DEFICIENS

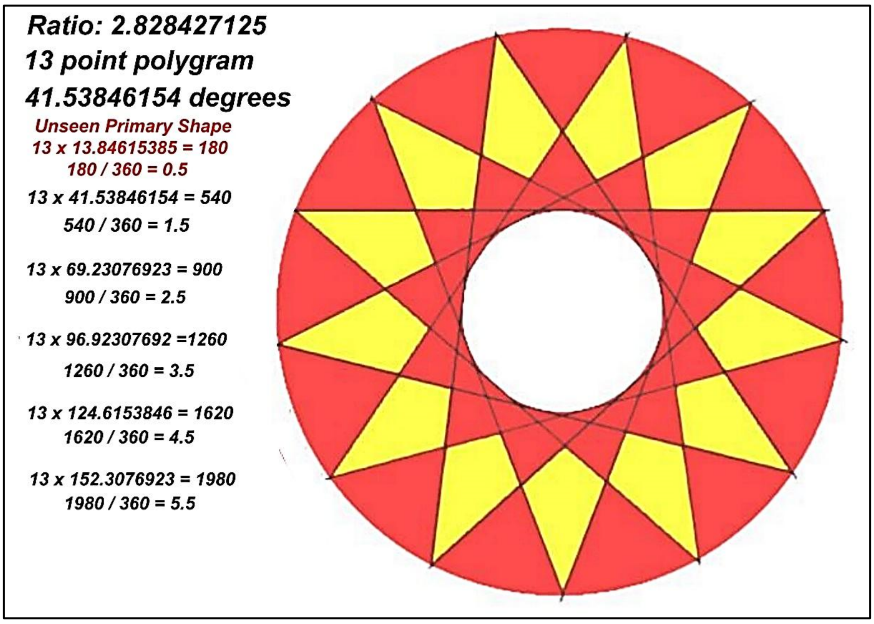


26 points (or 2 x 13 points in phase)
Or 52 points (4 x 13 points in phase)

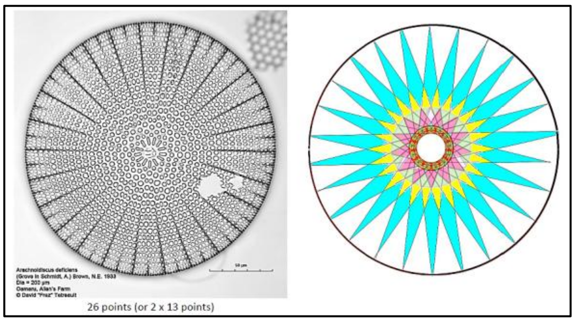
Note	Music FREQ / 100	DEGREES	SHAPE	Shape Ratios (Ratios including refined results)	*Shape Harmonic Multipliers*	*Shape / Music Differential Harmonics*	DIATOM & SHAPE Points	DIATOM Genus	DIATOM Species
G_4	7.839908720	13.846153850	**13 pts**	8.000000000	1.080363027	1.020420044	***13 IN PHASE*** *4 times*	13 / 26 / 52	Arachnoidiscus Deficiens
C_3#	2.771826310	41.538461540	**13 pts**	2.828427125	1.080363027	1.020420044	***13 IN PHASE twice***	13 /26	Arachnoidiscus Deficiens

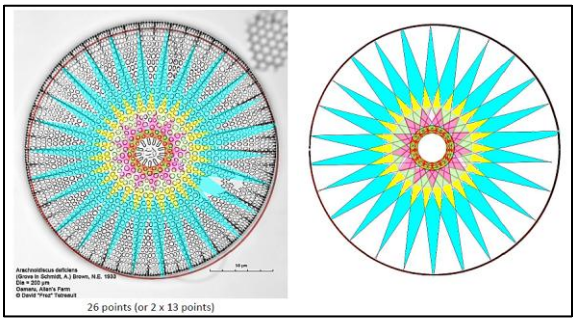
Note	Music FREQ / 100	DEGREES	SHAPE	Shape Ratios Ratios including refined results	Shape Harmonic Multipliers	Shape / Music Differential Harmonics	DIATOM & SHAPE Points	DIATOM Genus	DIATOM Species
C₃#	2.771826310	41.538461540	13 pts	2.828427125	1.080363027	1.020420044	13 IN PHASE twice	13 /26	Arachnoidiscus Deficiens



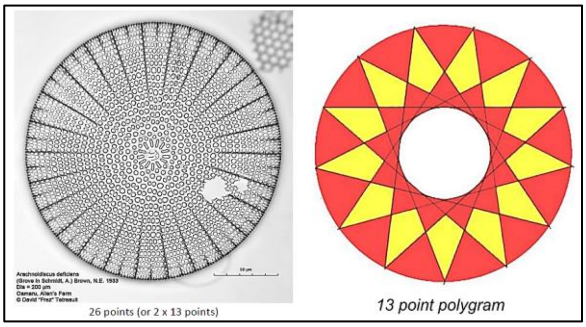


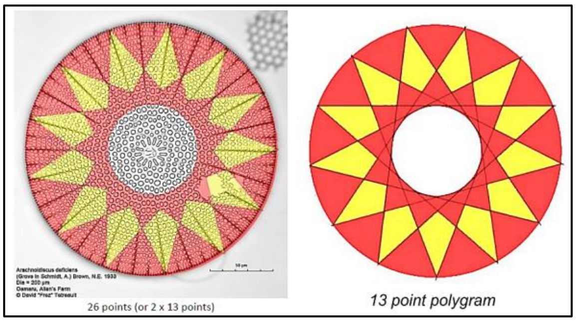
ARACHNOIDISCUS DEFICIENS





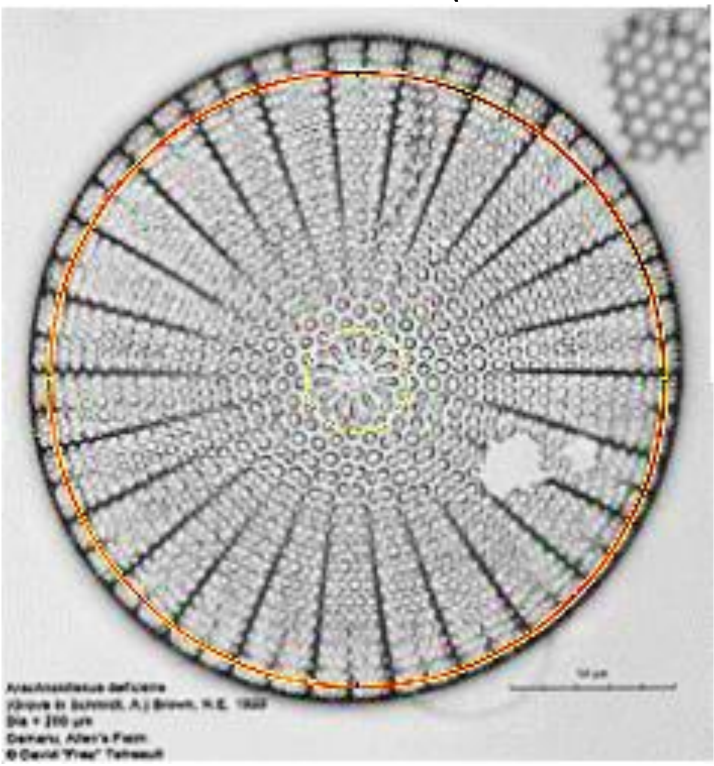
ARACHNOIDISCUS DEFICIENS





ARACHNOIDISCUS DEFICIENS

AND NATURE SHOWS US THE CIRCLES AS WELL. (*ALL ON A SINGLE CELLED DIATOM!*)

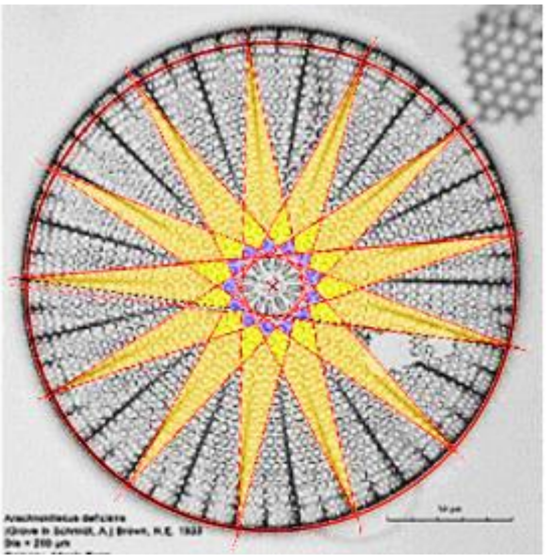


AND SHE GIVES US RADIAL MARKINGS TO HELP IN IDENTIFICATION OF THE APPLICABLE CANDIDATE.

13 – 26 – 39 – 52

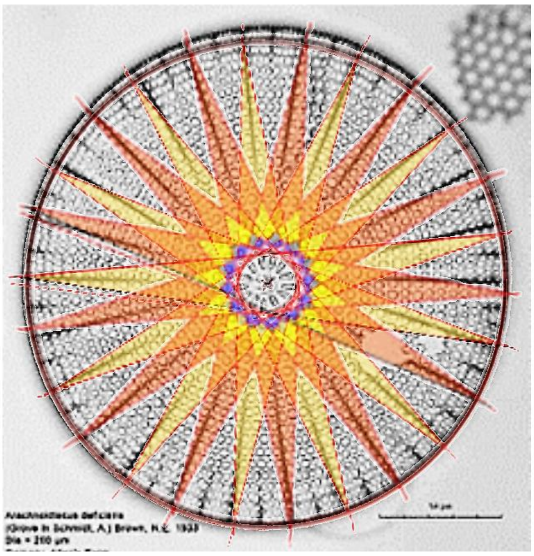
NUMBER OF RADIALS ALLOCATED TO RESULTING SHAPES:

13



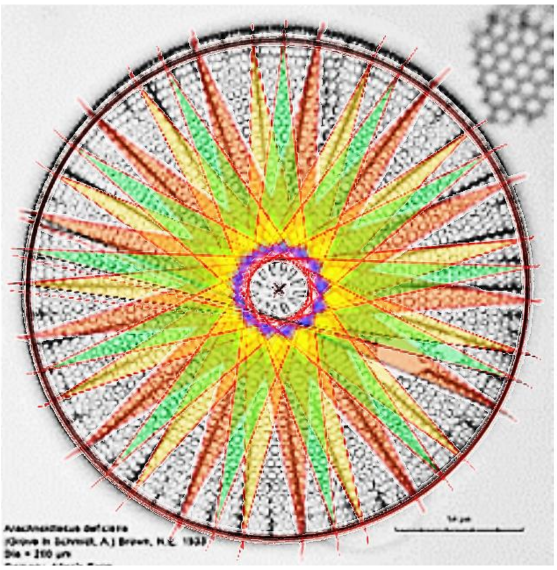
SINGLE PRIME SHAPE

26



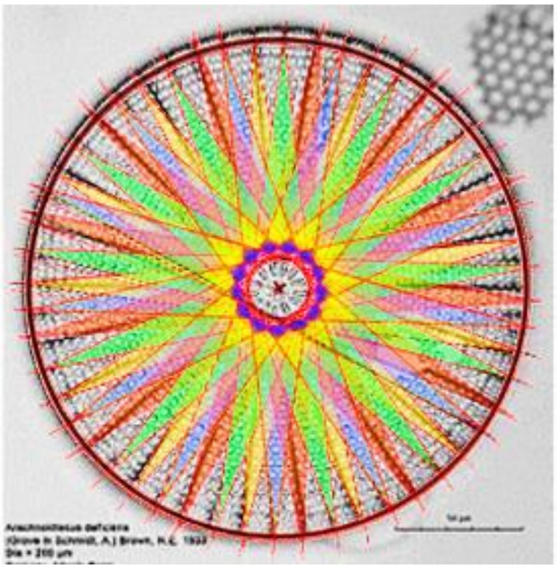
SINGLE PRIME SHAPE -
IN PHASE TWICE

39



SINGLE PRIME SHAPE
IN PHASE THREE TIMES

52



SINGLE PRIME SHAPE
IN PHASE FOUR TIMES

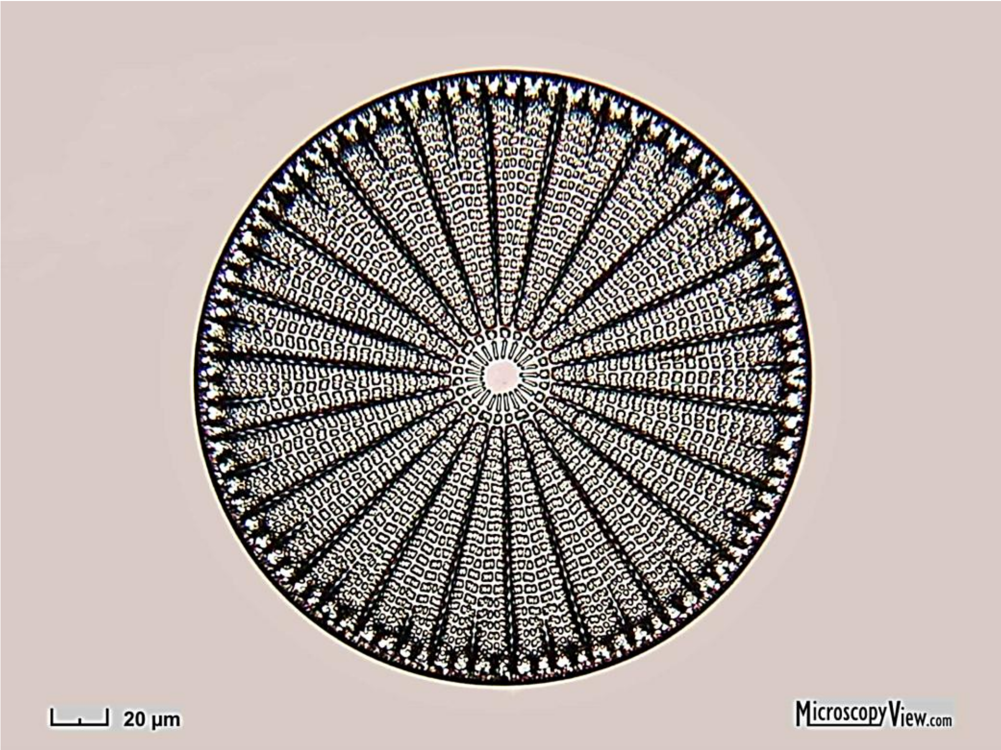
AND THE MATHEMATICS CONTAINED IN THE DIATOM AGREE.

PRIME 13 POINT POLYGRAM HIDING WITHIN DUPLICATES OF ITSELF IN PHASE
(A PHYSICAL EXAMPLE OF ENTANGLEMENT)?

The Ratio for the applicable shape remains that for the single 13 point polygram The Outer and Inner Circles remain the same.

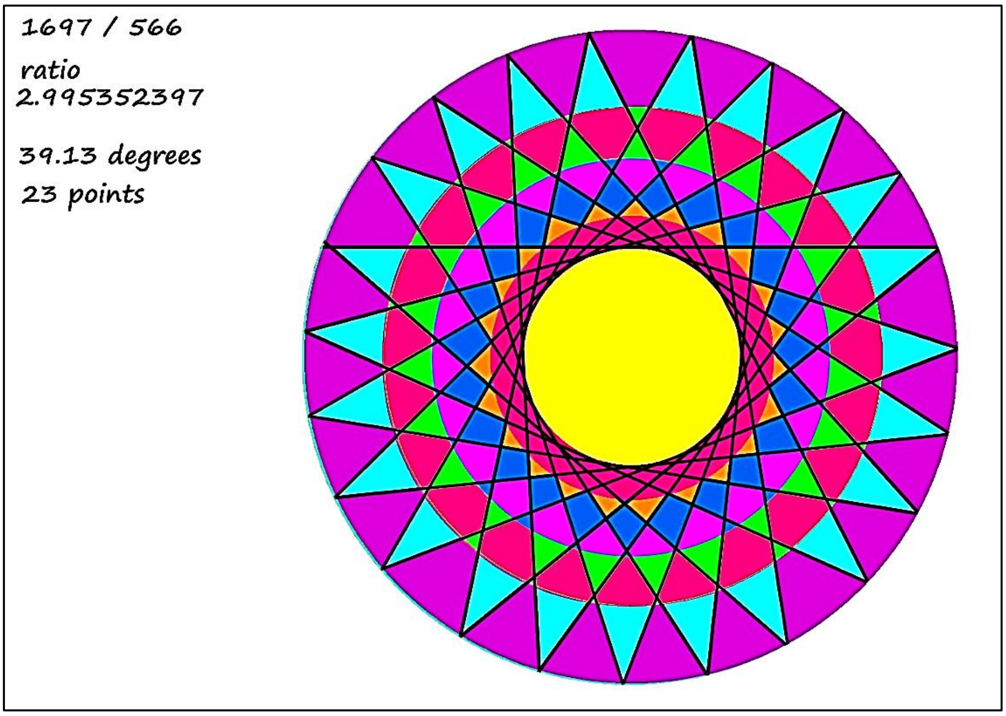
Arachnoidiscus ehrenbergii

J.W. Bailey in Ehrenberg, Diatom, MicroscopyView, Robert Lavigne



23 points.

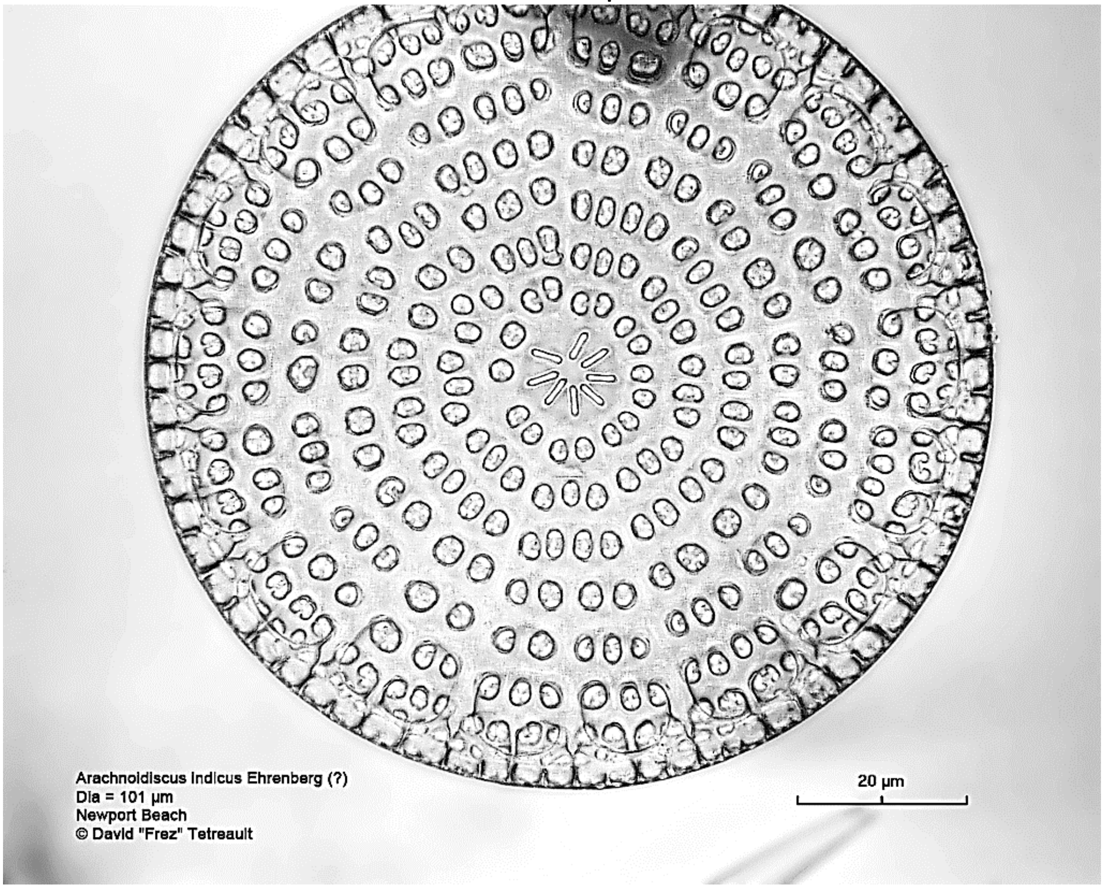
Note the (more than a) hint of an Intermediate Circle.



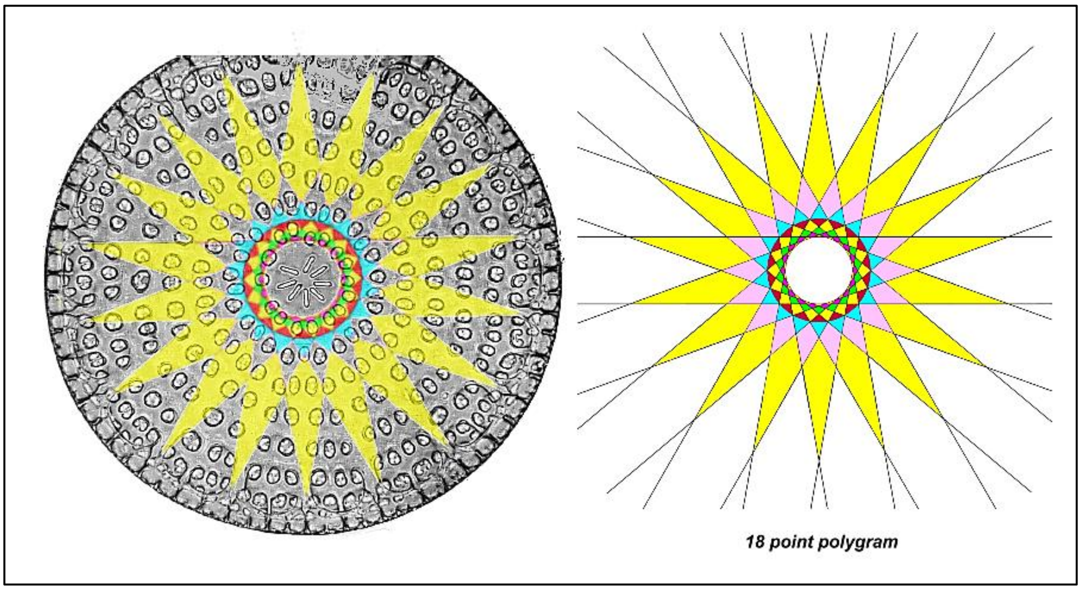
Interesting Flickr photos tagged arachnoidiscus | Picssr

Arachnoidiscus indicus Ehrenberg Nikon 100x APO Diatom

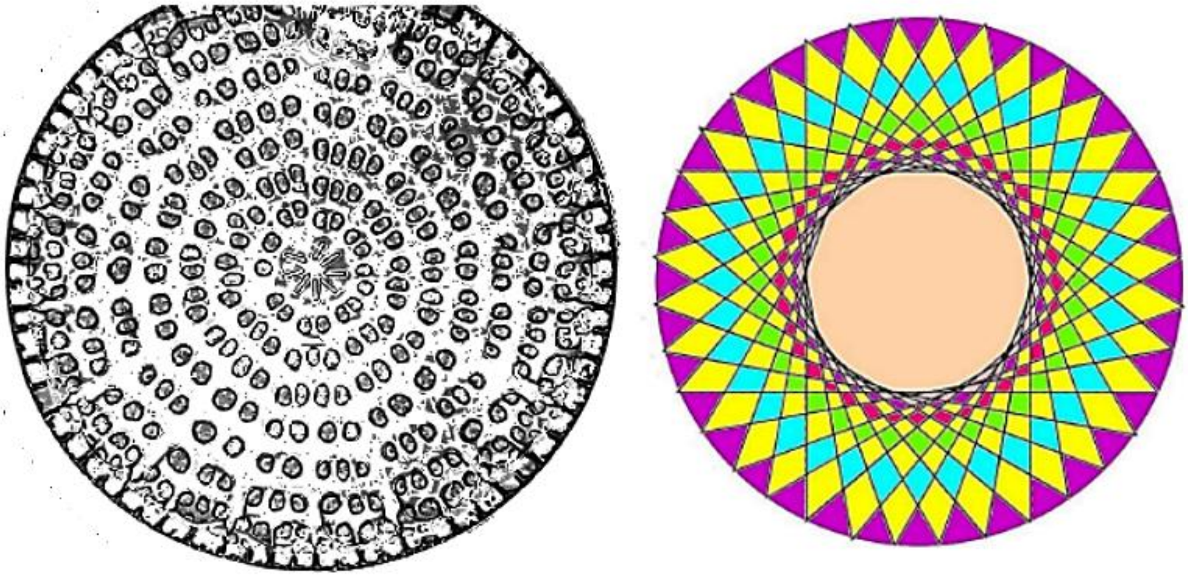
9 or 18 or 36 points



With an 18 point (or 2 x 9 points in phase) polygram.

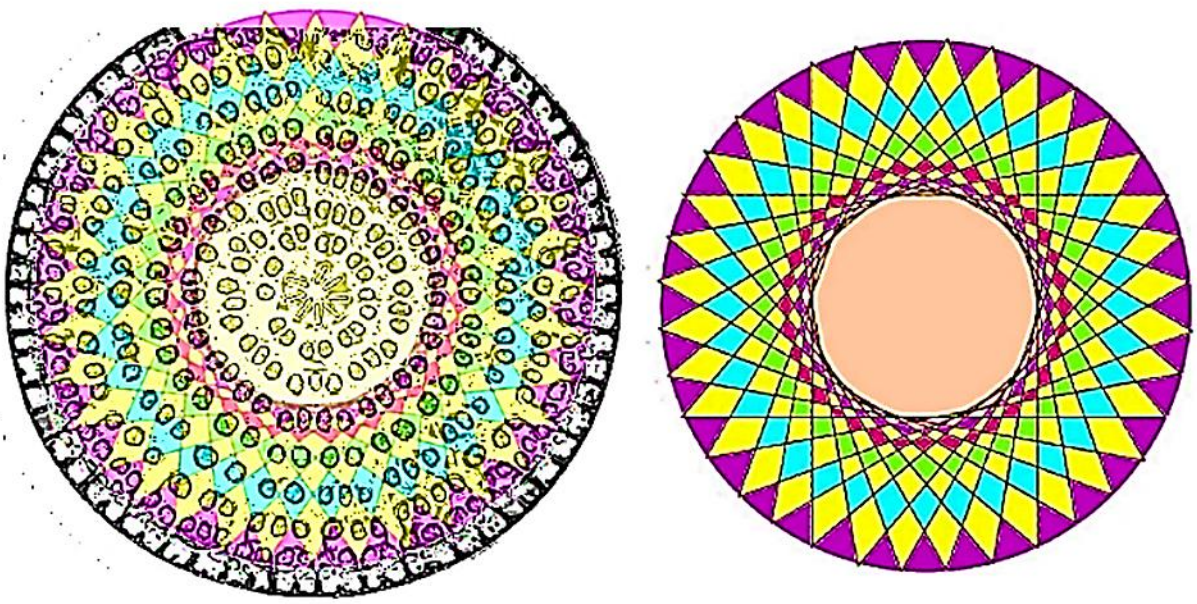


Arachnoidiscus indicus

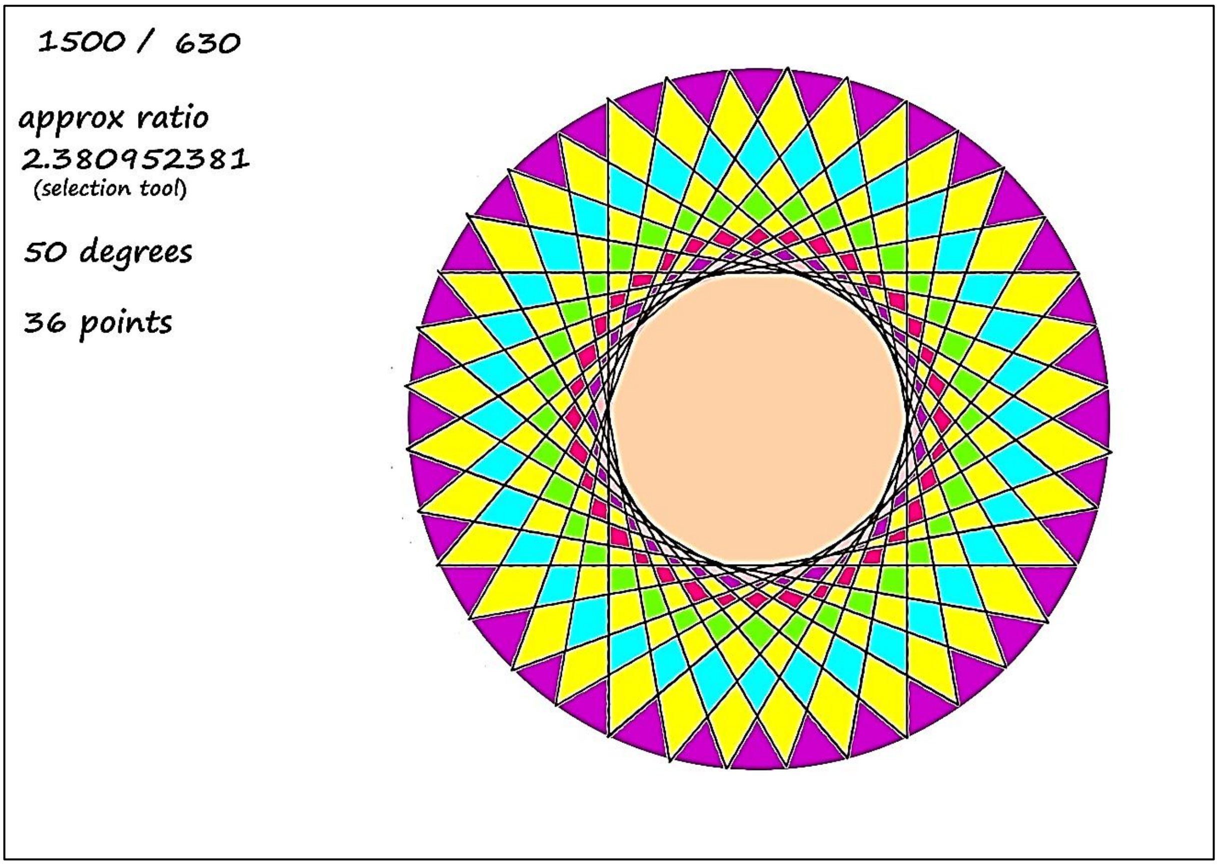


9 / 18 / 36

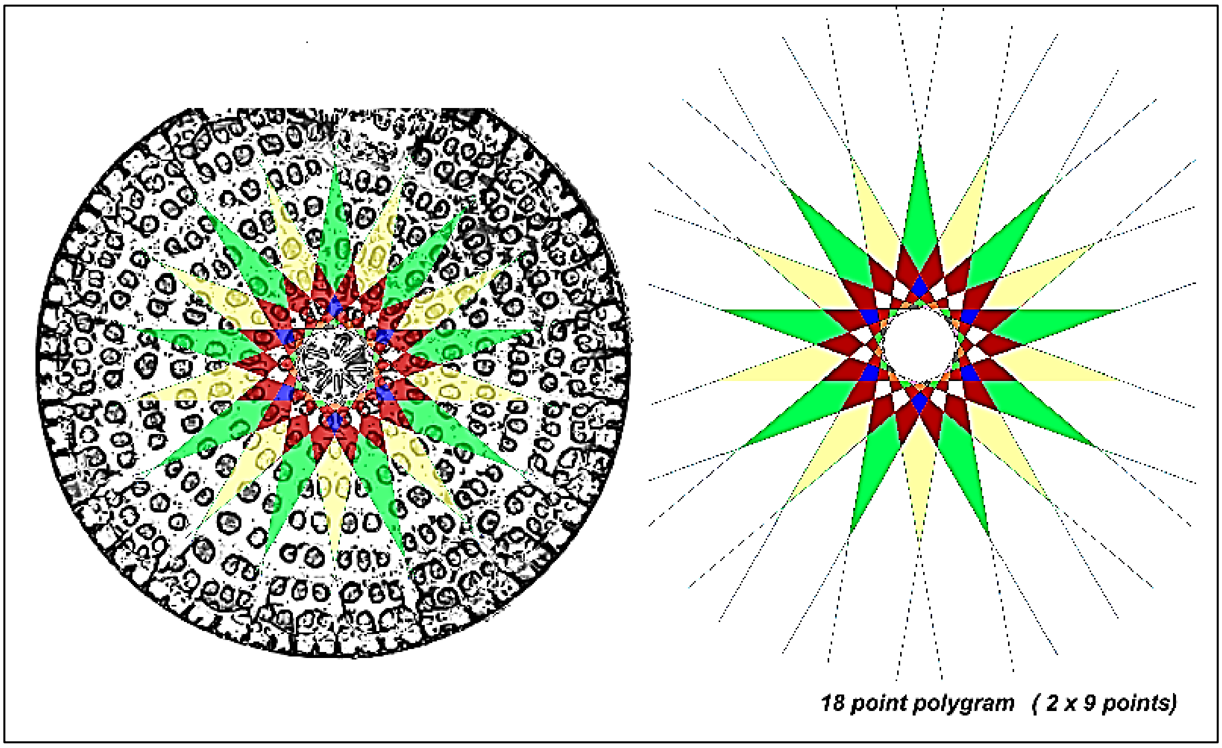
With a 36 point polygram



9 / 18 / 36



With **2 x 9 point polygrams in phase**.

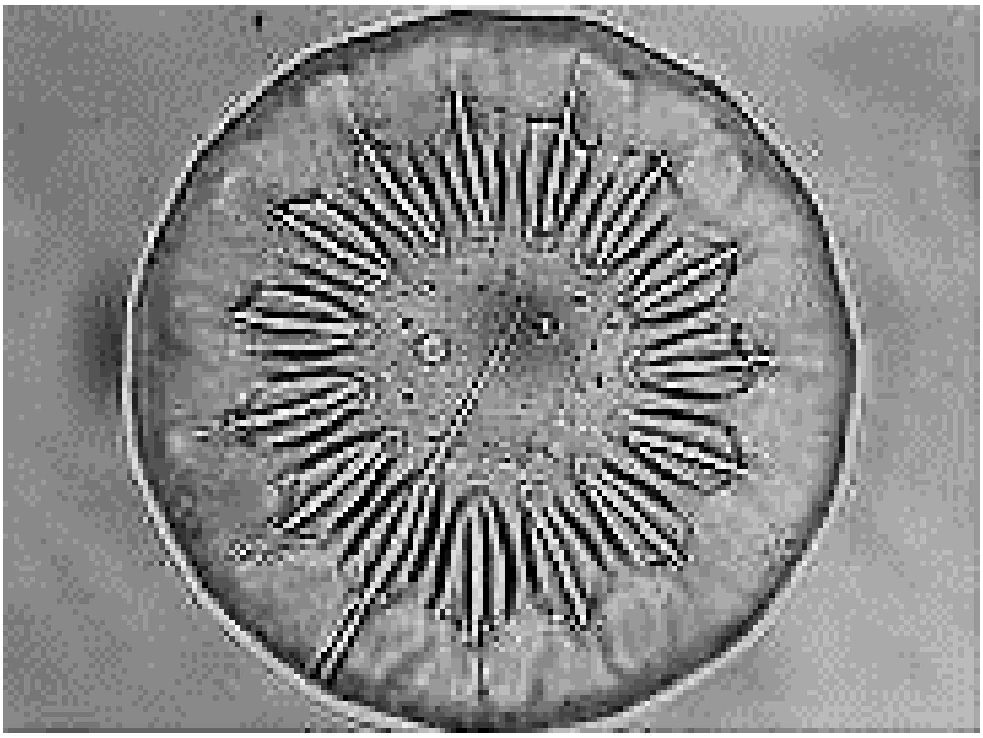


THIS COMBINATION SUITS THE RADIALS BEST.

Diatomées (en attente de correction et de classement) - Galerie ...

Le Naturaliste 181 × 150

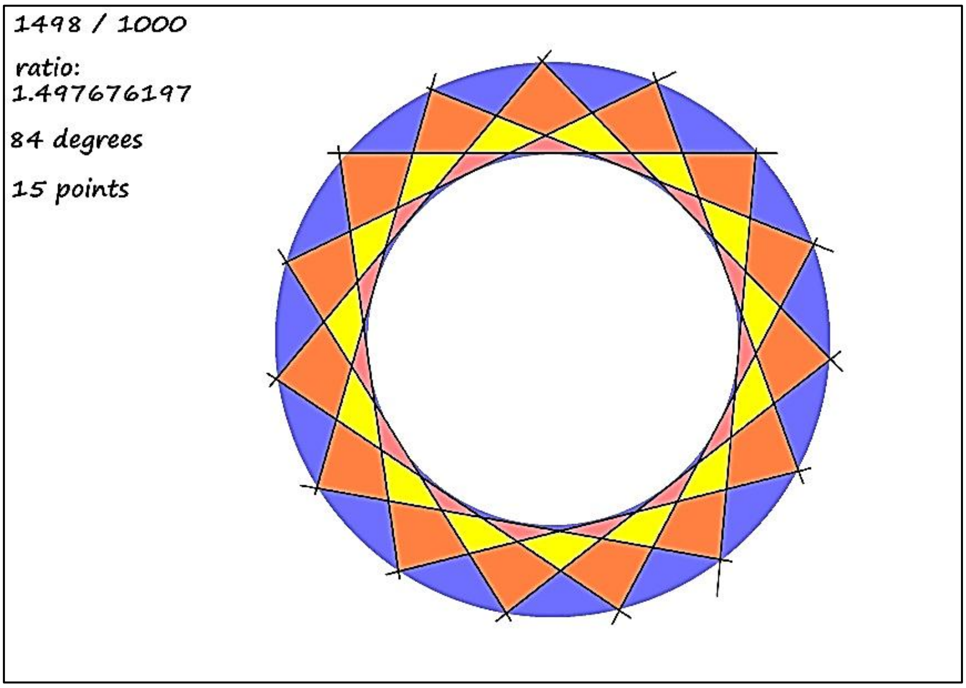
ASTEROLAMPRA AEMULANS

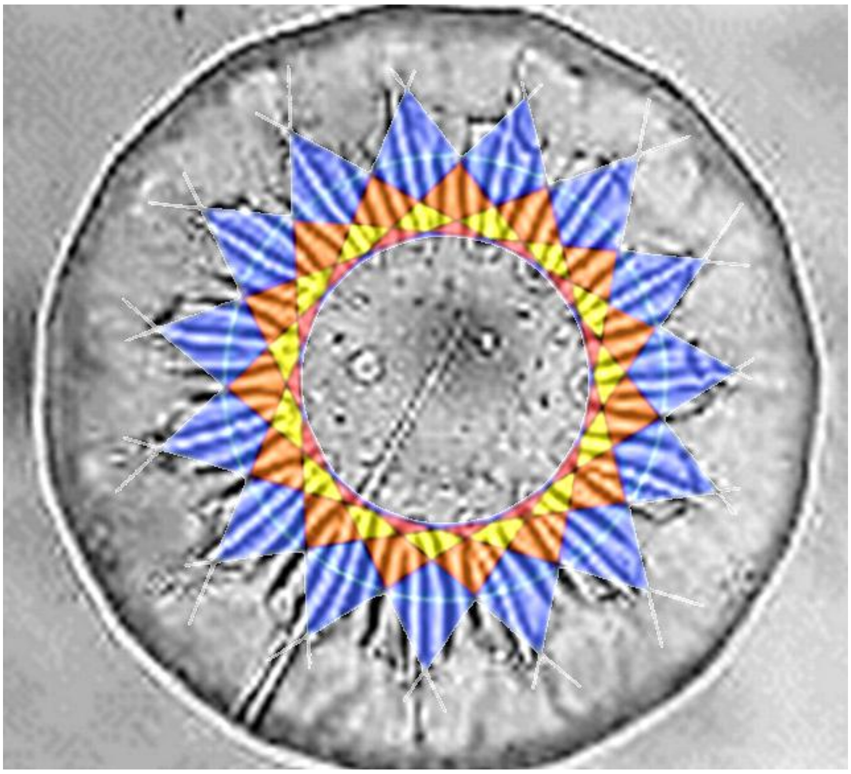


15 / 45 / 60 points

Or **5 x 3 points (Equilateral Triangles) in Phase – PRIME.**

Or **3 x 5 points (Pentagons) in Phase. –. PRIME**



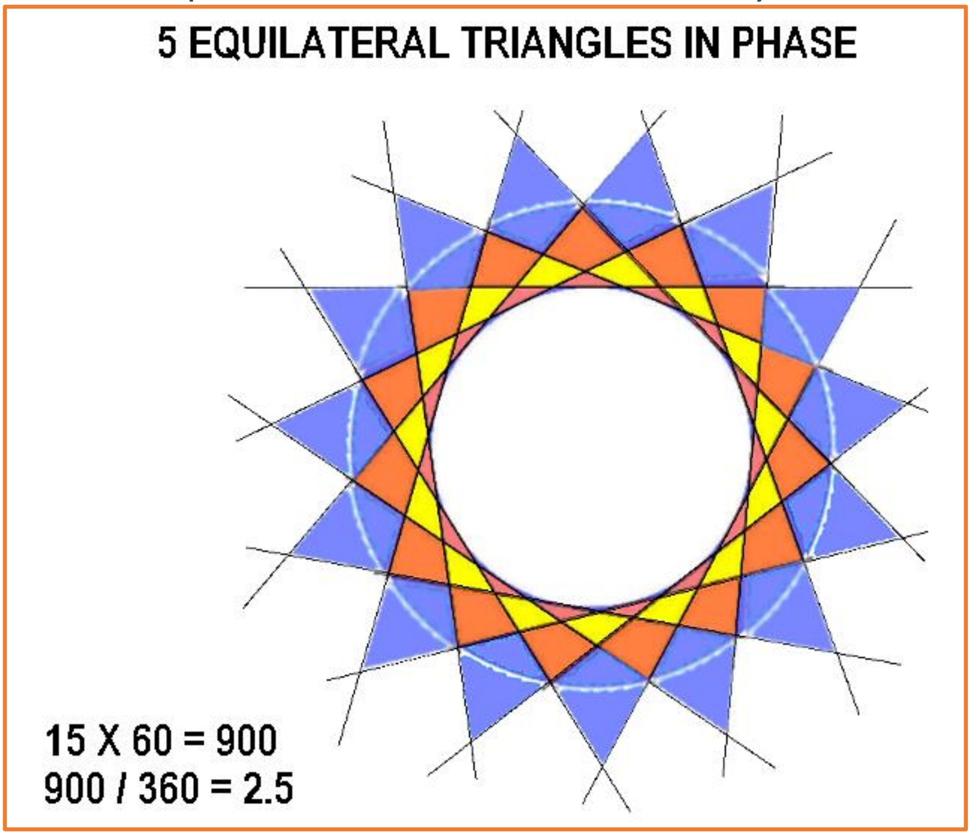


5 EQUILATERAL TRIANGLES IN PHASE – PRIME

5 X 3 = 15

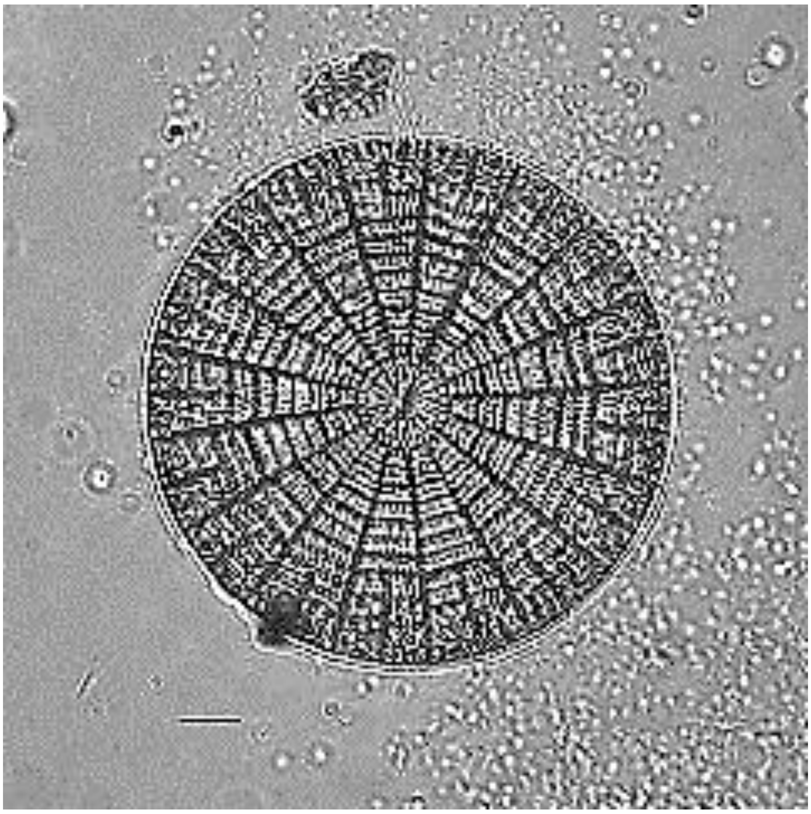
ANOTHER PRIME NUMBERED DIATOM IN PHASE (5 times)

(A PHYSICAL EXAMPLE OF ENTANGLEMENT)?

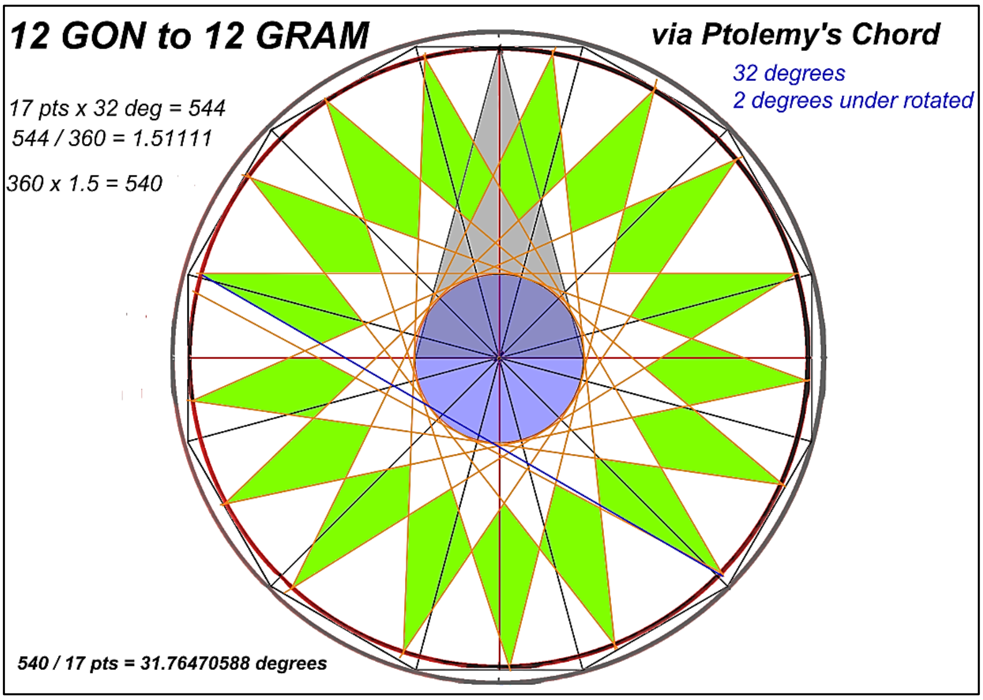


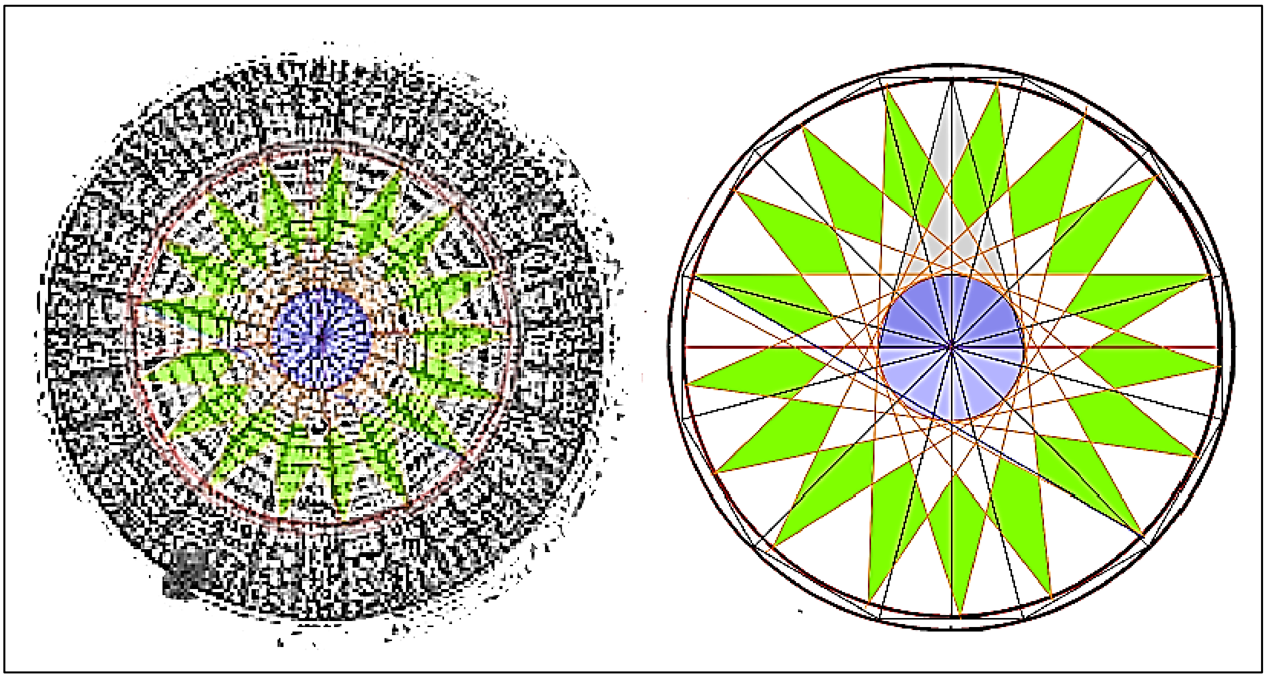
Arachnoidiscus photos

17 point polygram - PRIME



17 / 34 points



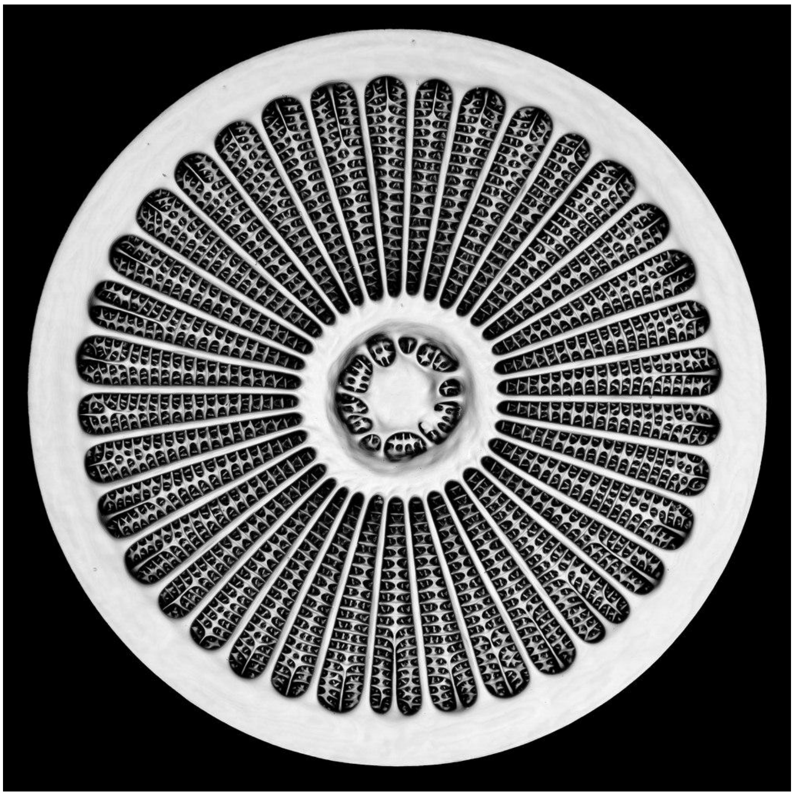


With a 17 point Polygram derived from Ptolemy's Chords.

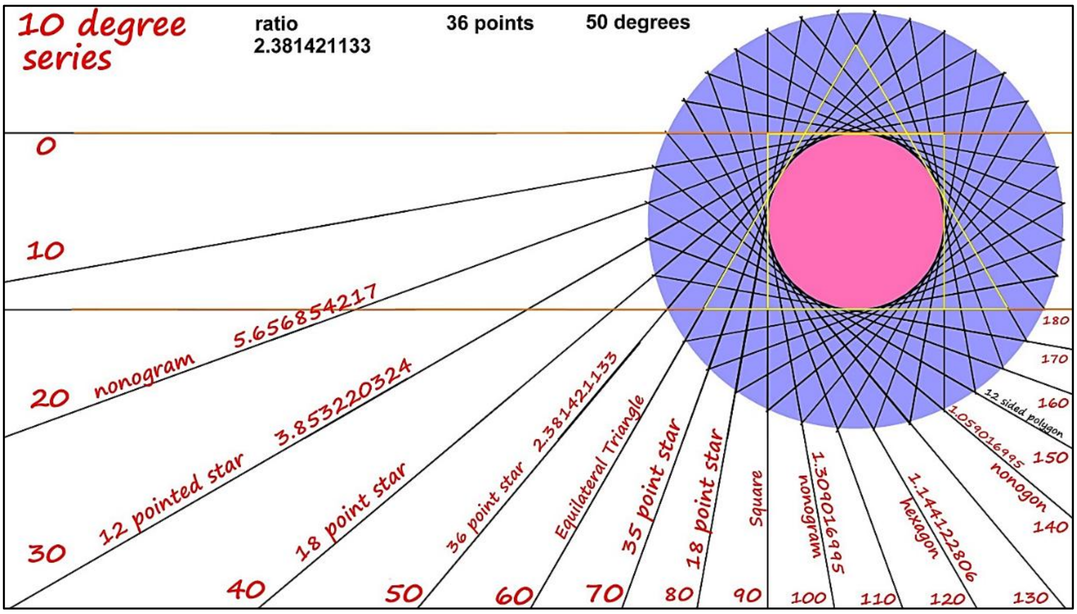
PRIME

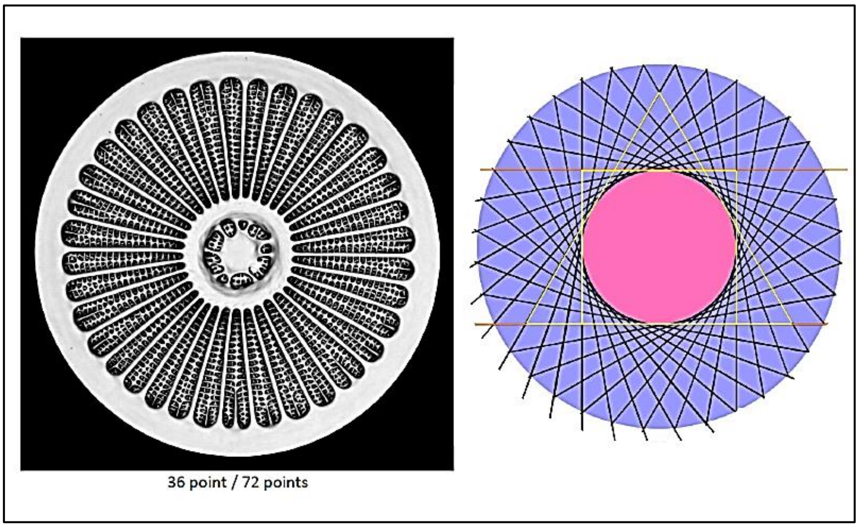
'Interesting photo tagged arachnoidiscus'

Marine diatom Arachnoidiscus sp.

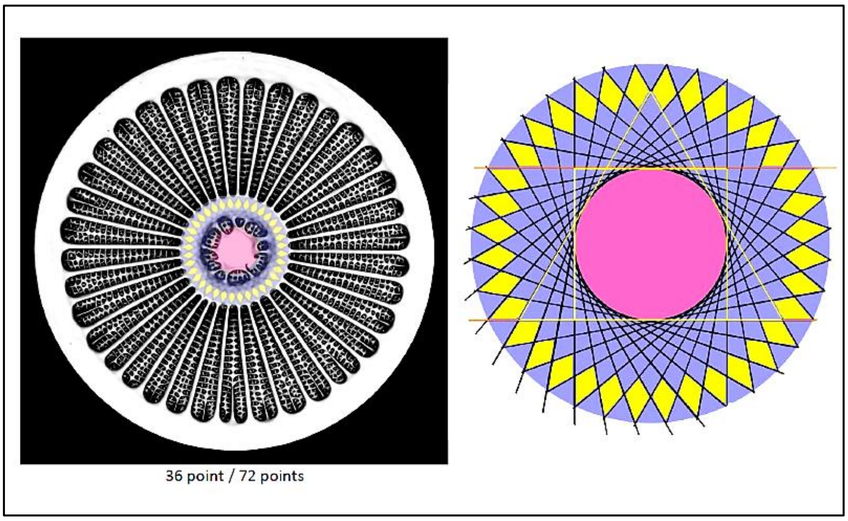


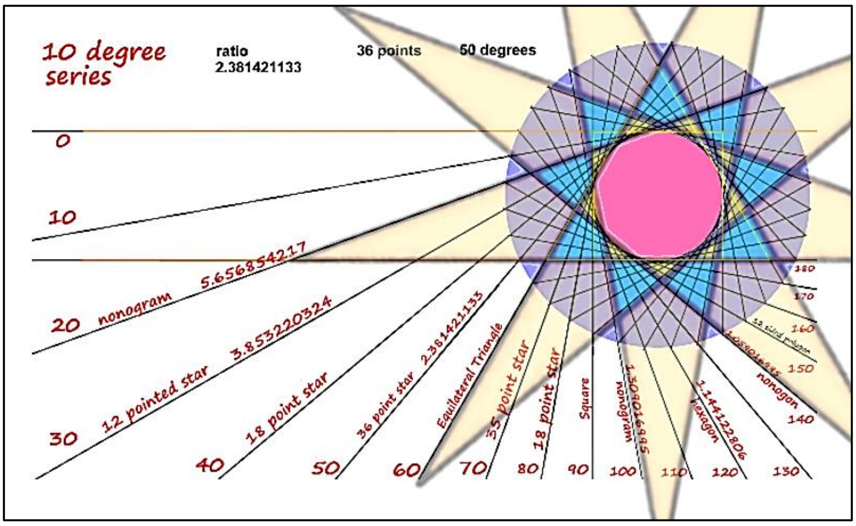
36 point / 72 points

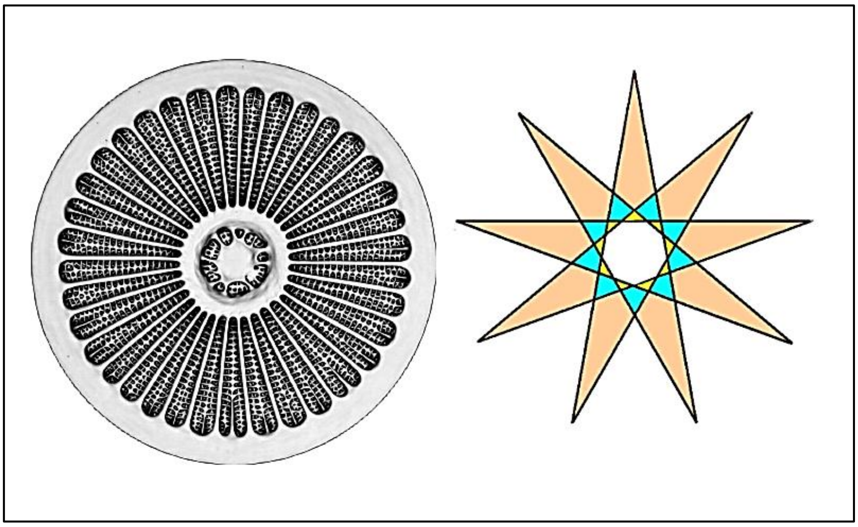




With a 36 point Polygram



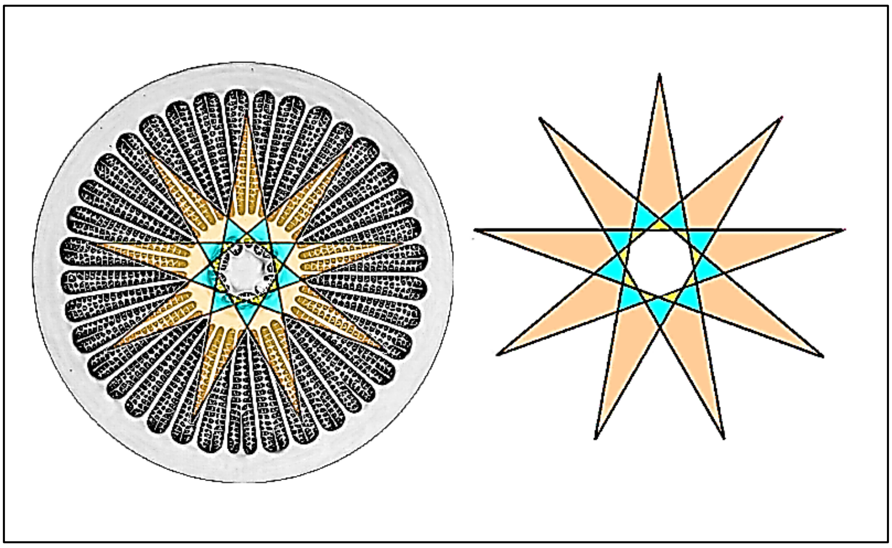


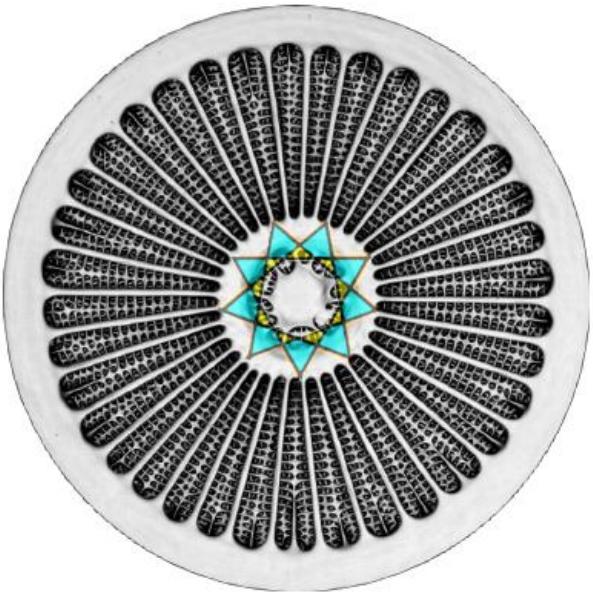


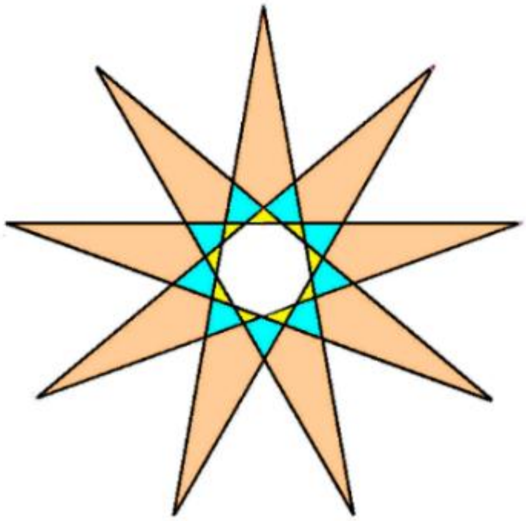
SHAPES IN PHASE

With a 9 point Polygram (Nonogram)

(A PHYSICAL EXAMPLE OF ENTANGLEMENT)?

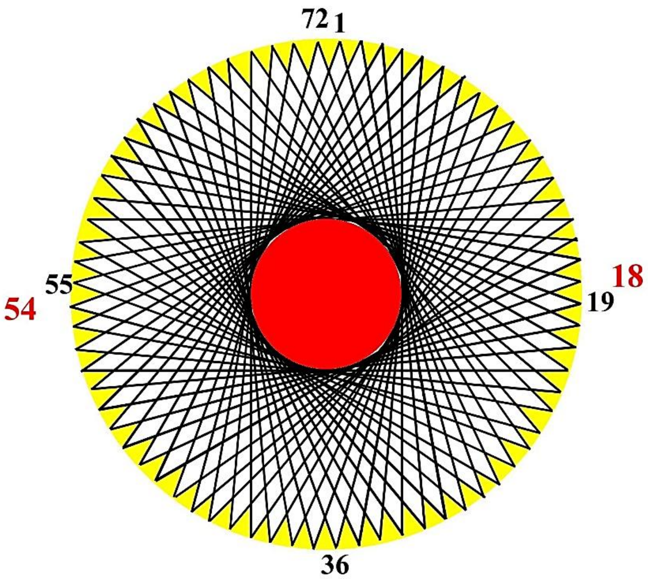






35 degrees
72 points

1070 / 315
Ratio: Approx
3.396825397

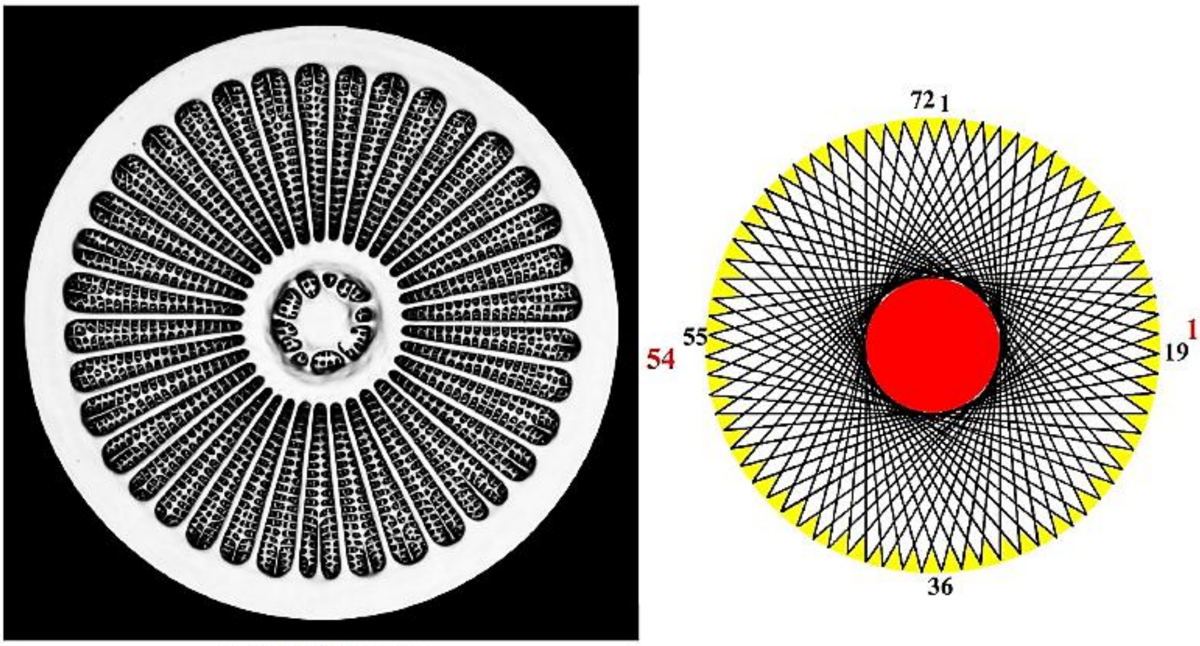


1070 / 318
3.364779874

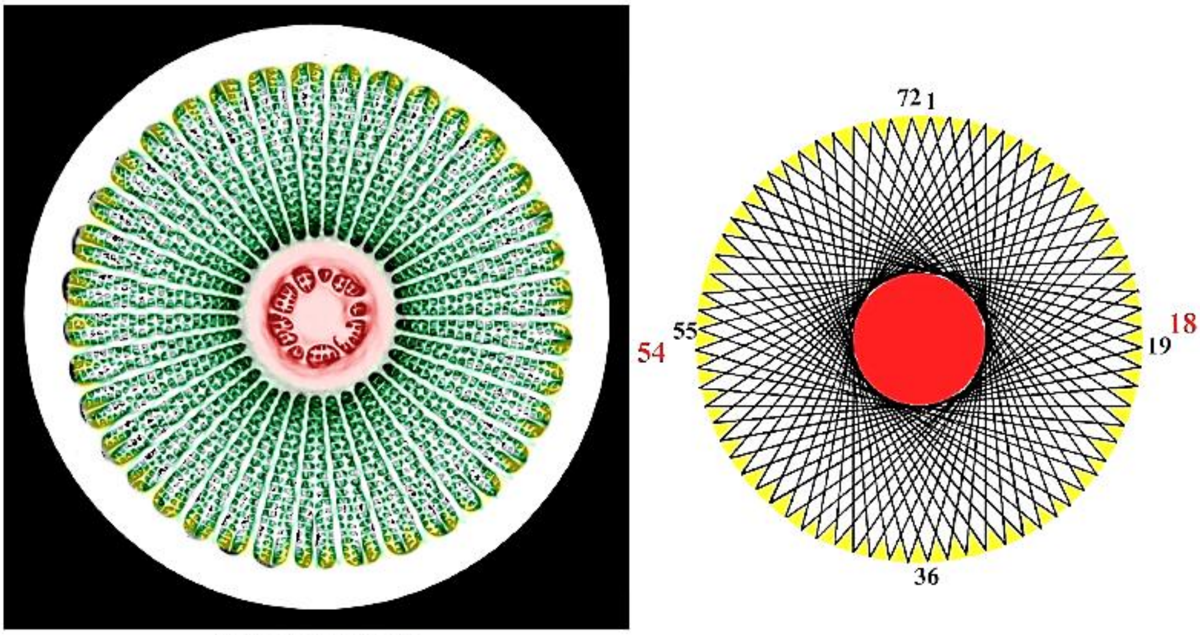
1070 / 317
3.375394322

1070 / 316 **3.386075949**

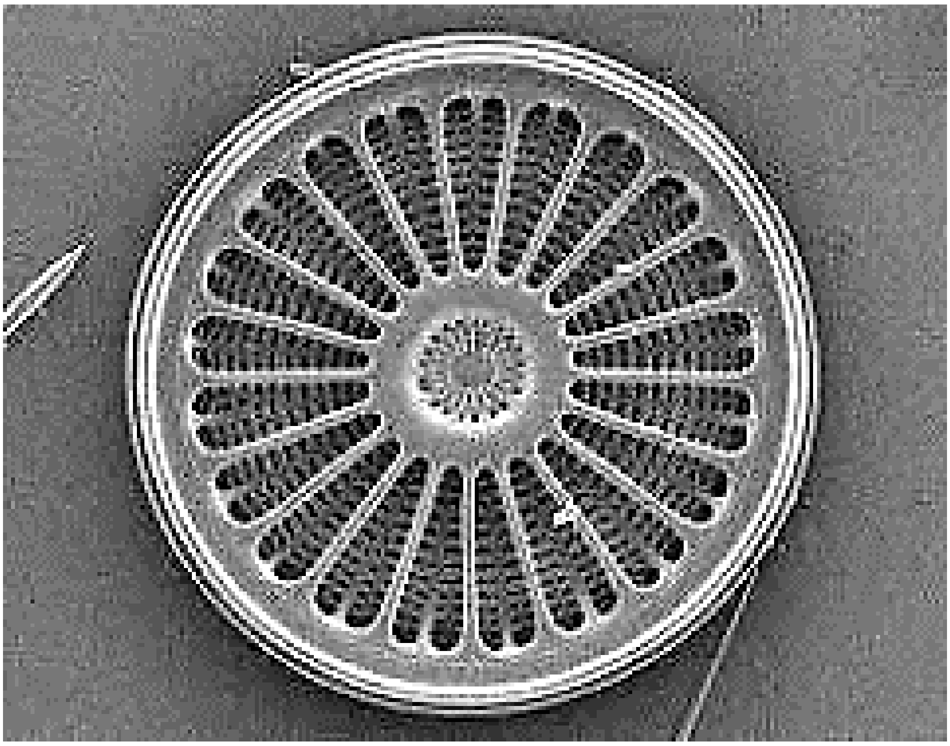
Saturn to Jupiter...3.378884661
886 million miles to 482 million miles
1.838174274 squared



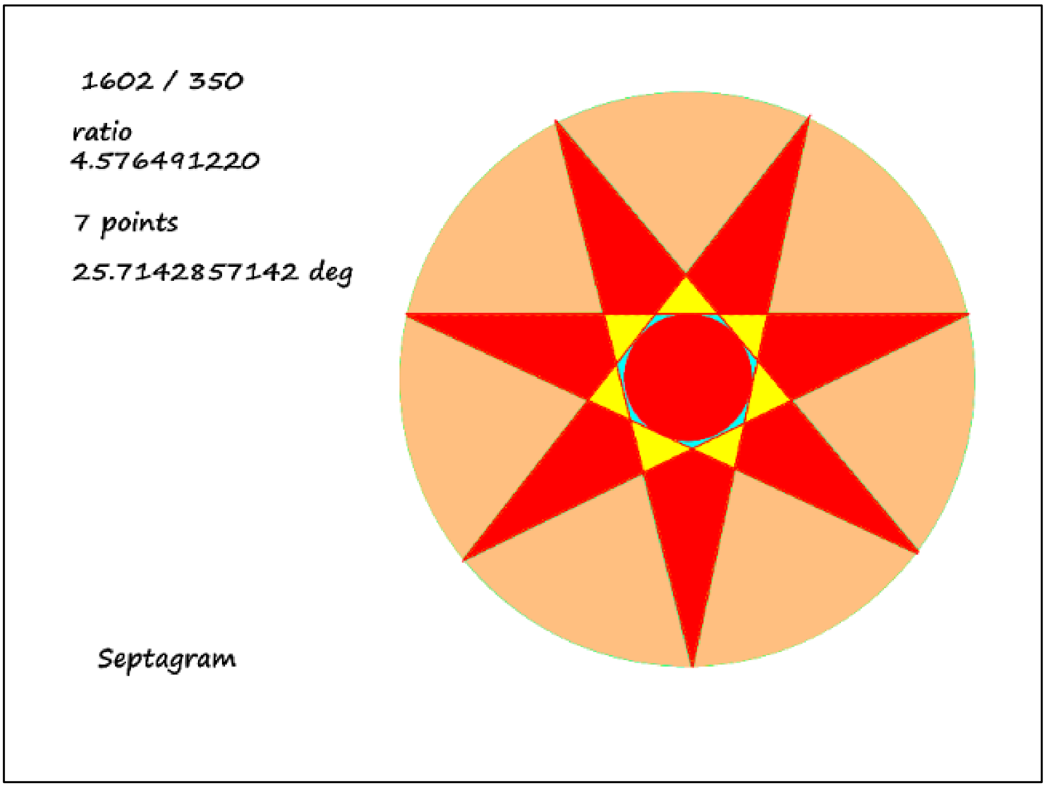
36 point / 72 points



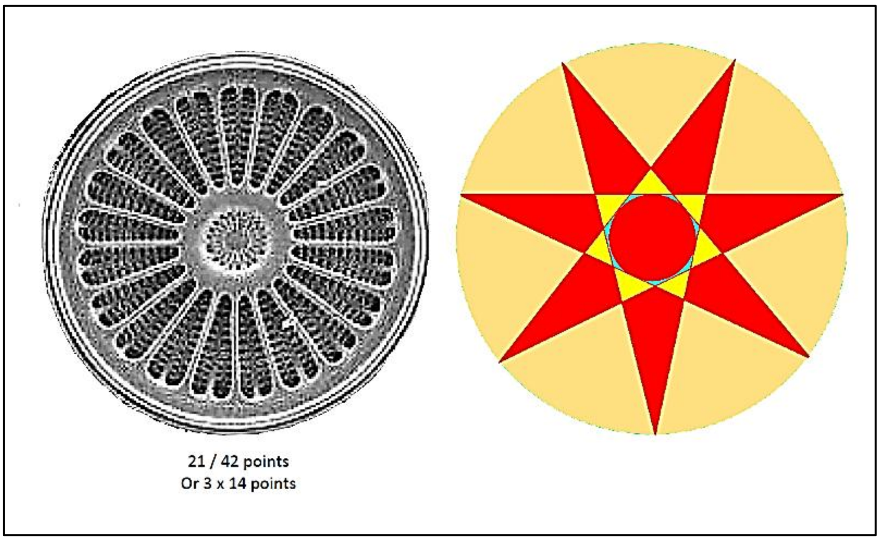
36 point / 72 points



21 / 42 points
Or 3 x 14 points – or 3 x 7 points

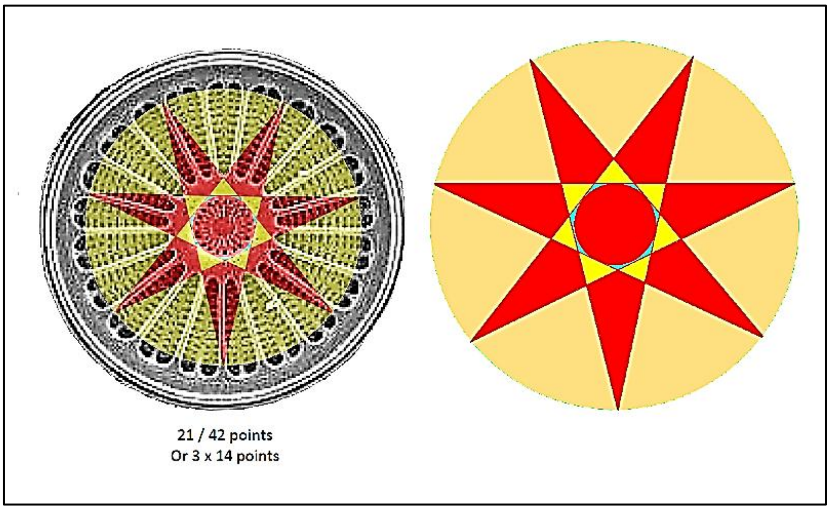


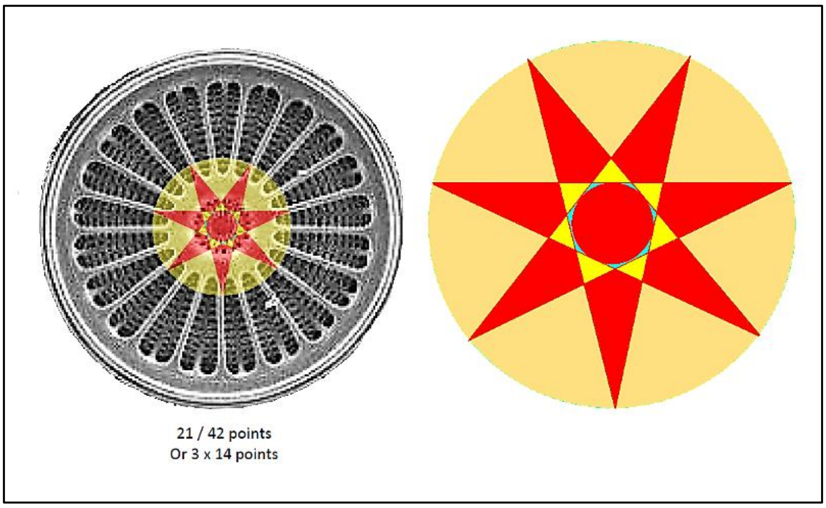
3 x 7 point septagrams in phase



Showing the possibility of **7 points 3 times in phase - PRIME**.

(A PHYSICAL EXAMPLE OF ENTANGLEMENT)?

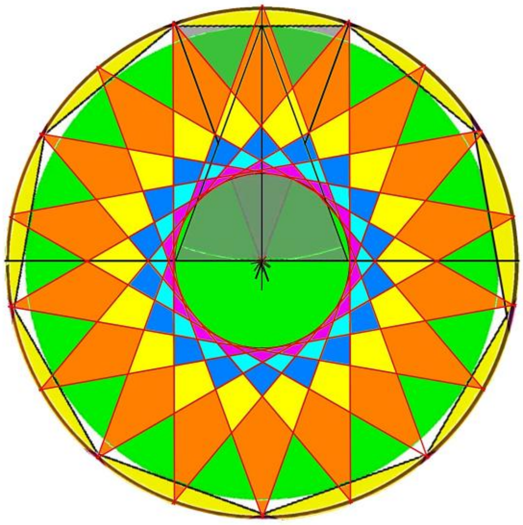




Deg	Shape	Ratio
40	18pts	2.936169614607910

RATIOS DERIVED FROM PTOLEMY'S NONOGON CHORD TRIANGLE

Deg	Shape	Ratio
140	9pts nonogon	1.059016995000000
120	hexagon	1.144122806000000
100	inner nonogram	1.309016994000000
80	18pts	
60	Equilateral Triangle	2.000000000000000
40	18pts	2.936169614607910
20	**nonogram**	5.656854249492380



Deg	Shape	Ratio
140	9pts nonogon	1.059016995000000
120	hexagon	1.144122806000000
100	inner nonogram	1.309016994000000
80	18pts	
60	Equilateral Triangle	2.000000000000000
40	18pts	2.936169614607910
20	**nonogram**	5.656854249492380

Ratio variance	Deg variance		
1.080363026657570	1.166666667	1 1/6	7/6
1.144122804943020	1.2	1 1/5	6/5
	1.25	1 1/4	5/4
	1.333333333	1 1/3	4/3
1.468084807303960	1.5	1 1/2	3/2
1.926610173114190	2	1 1/1	2/1

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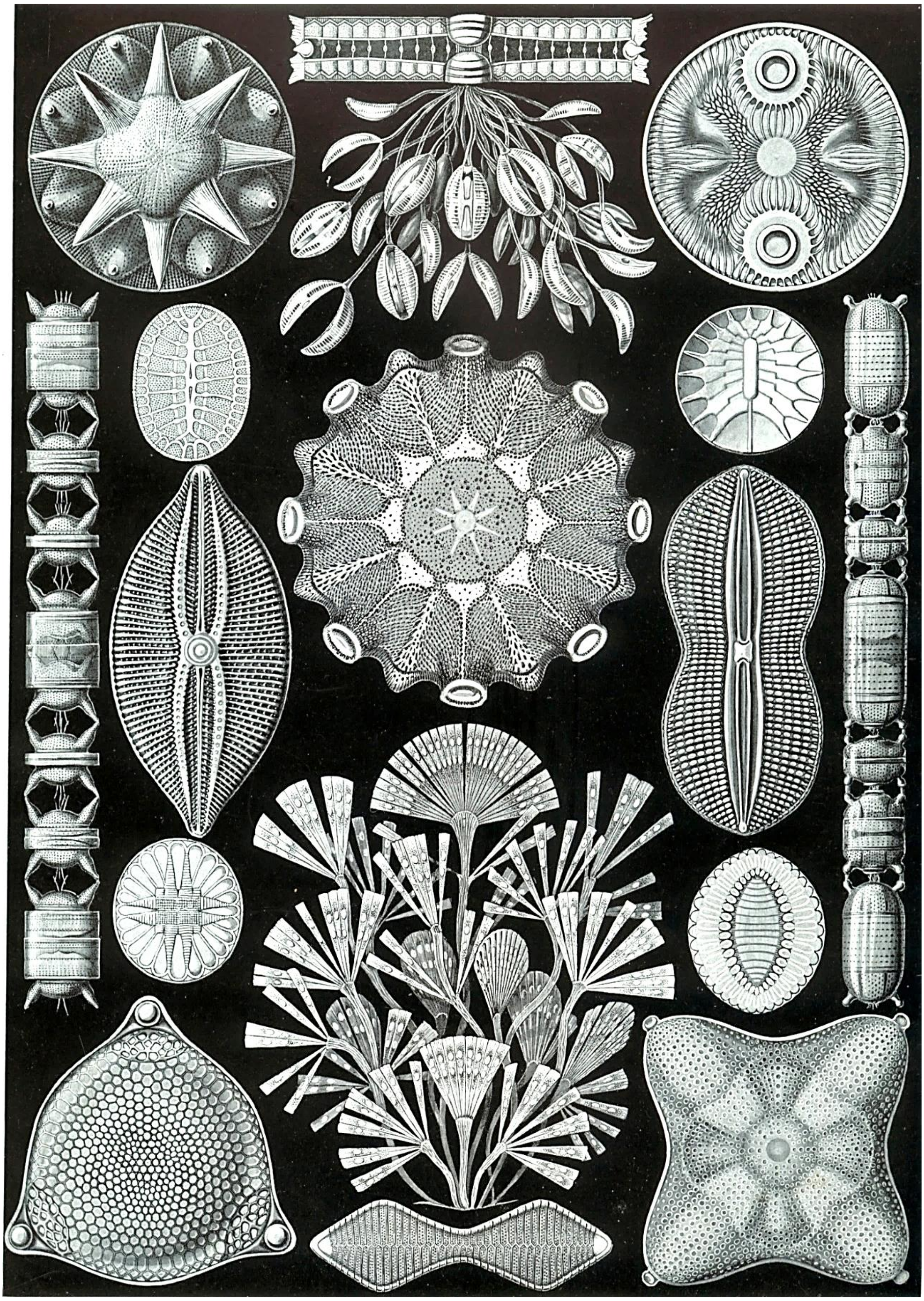
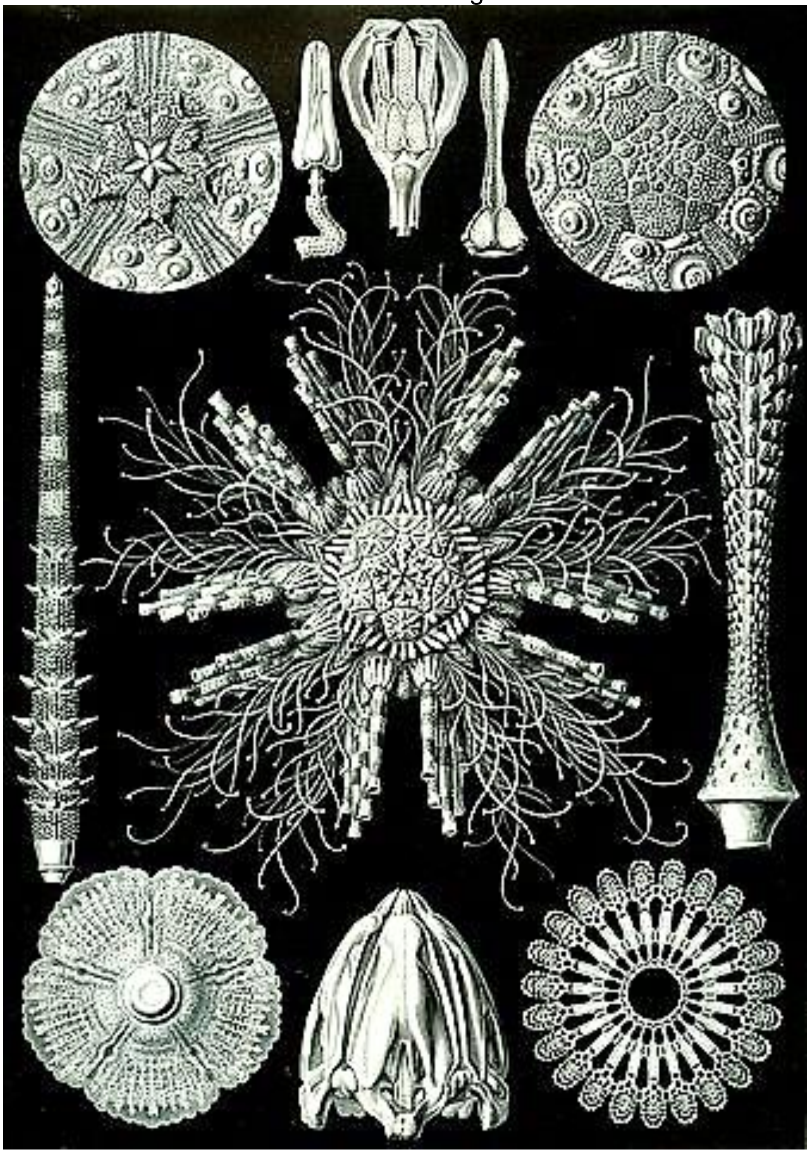
Palaeocast | Palaeontology podcasts2327 × 3276

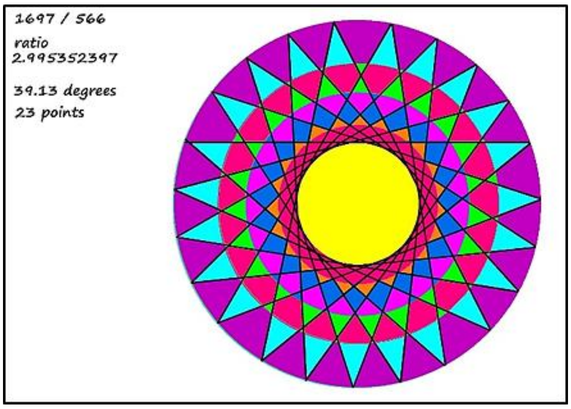
Haeckel Diatoms 2



File:Haeckel Echinidea 60.jpg - Wikimedia Commons
commons.wikimedia.org 337 × 480

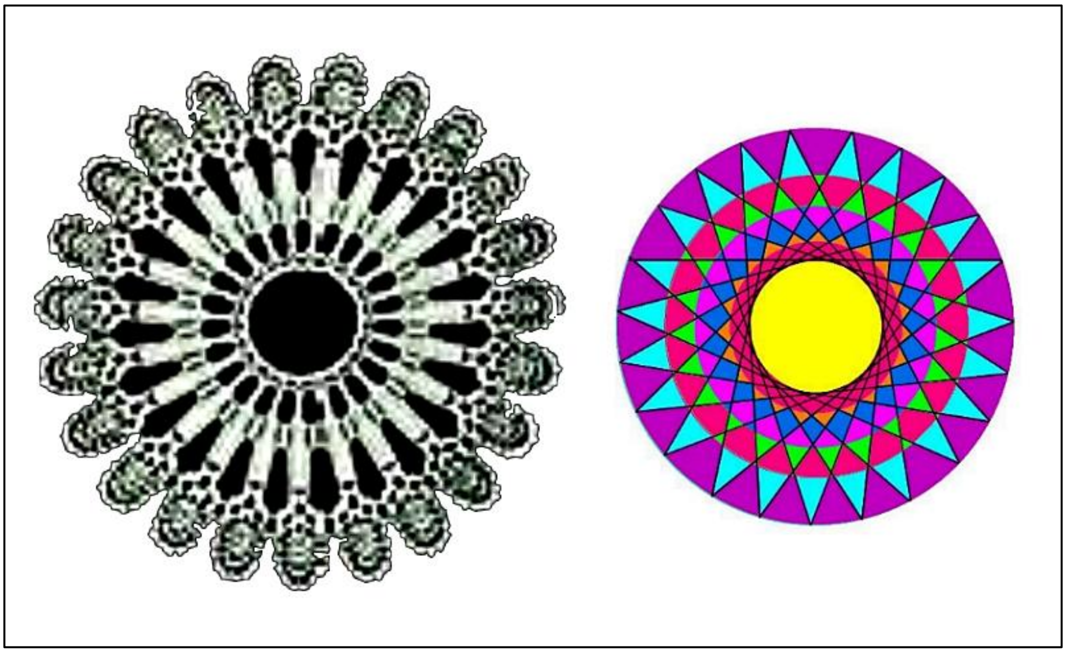


Bottom Right 23 points

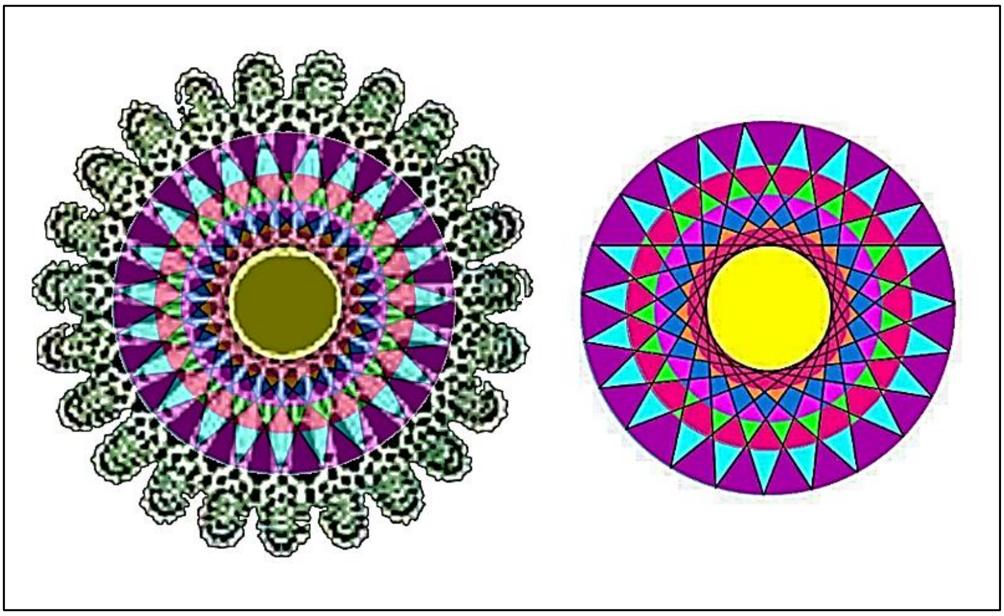


23 point polygram

A 23 POINT DIATOM AND ITS PLANE REGULAR SHAPE



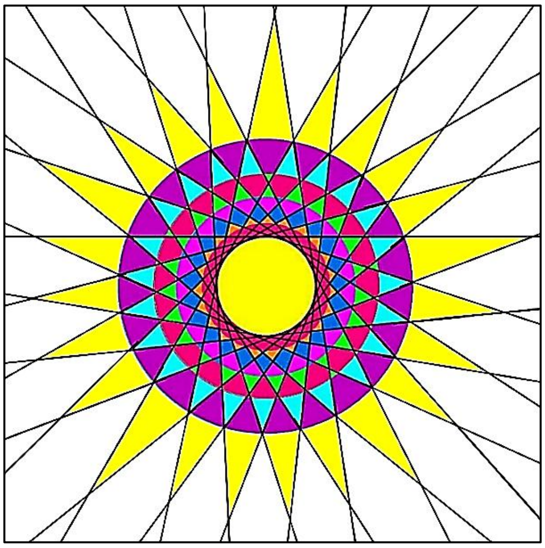
Note how well the green angles on the Regular Shape image suit the tiny white dashes on the Diatom. Note how the various bands of Shape Harmonics match the Diatom Image. Every feature on the Diatom, regardless of how insignificant it may seem, represents some harmonic or construction line of the Shape.



It is once again obvious that both the Plane Shape image and the Diatom Image here are intermediate harmonics of a larger shape. Once again the extensions of the construction lines on the Diatom image have left little bows to indicate further harmonics outside of this.

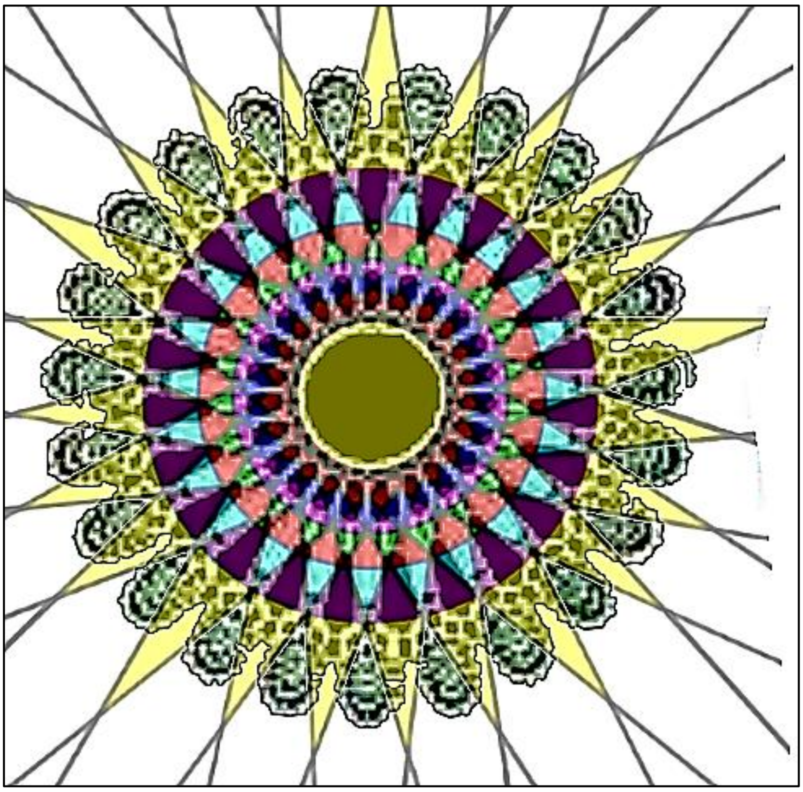
It is also evident that diatoms were not just copies of a Primary (or Outer) shape but were capable of conforming to any of the features or Harmonics and Mathematics within a Primary Shape.

23 POINT IMAGE EXTENDED TO ANOTHER HARMONIC LEVEL



In this next Image I have extended the sides of the Regular Shape further to see how well the extensions would fit in with the Diatom's Outer Harmonics.

The result was superb.

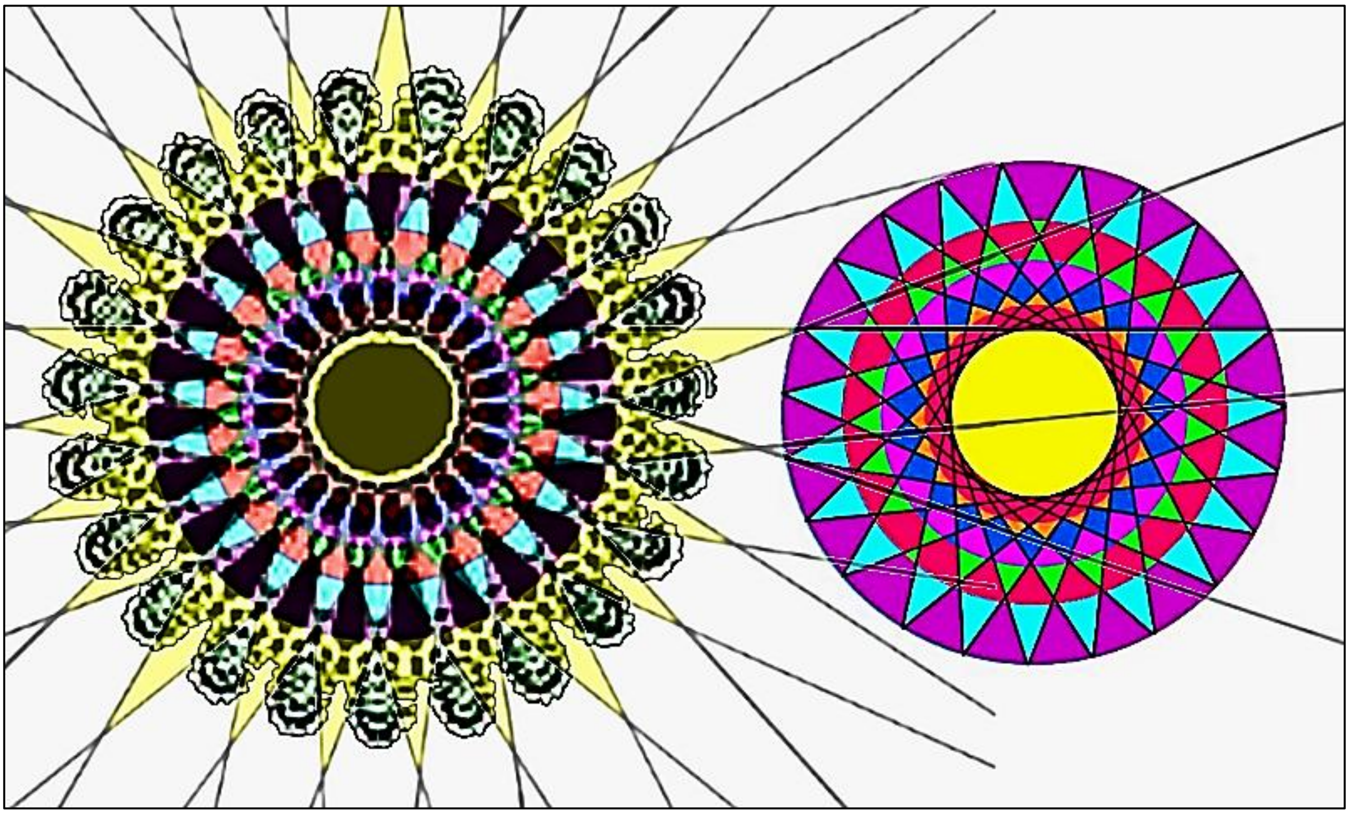


I hear you saying so what; it is just a shape.
But, how could a single celled creature from 30 – 35 million years ago faithfully reproduce all the features of the Inner Harmonics of a multi-pointed Plane Regular Shape when mankind cannot deduce a sufficient reason for, or an interpretation of, Stonehenge whose construction commenced only 3,000 years ago.

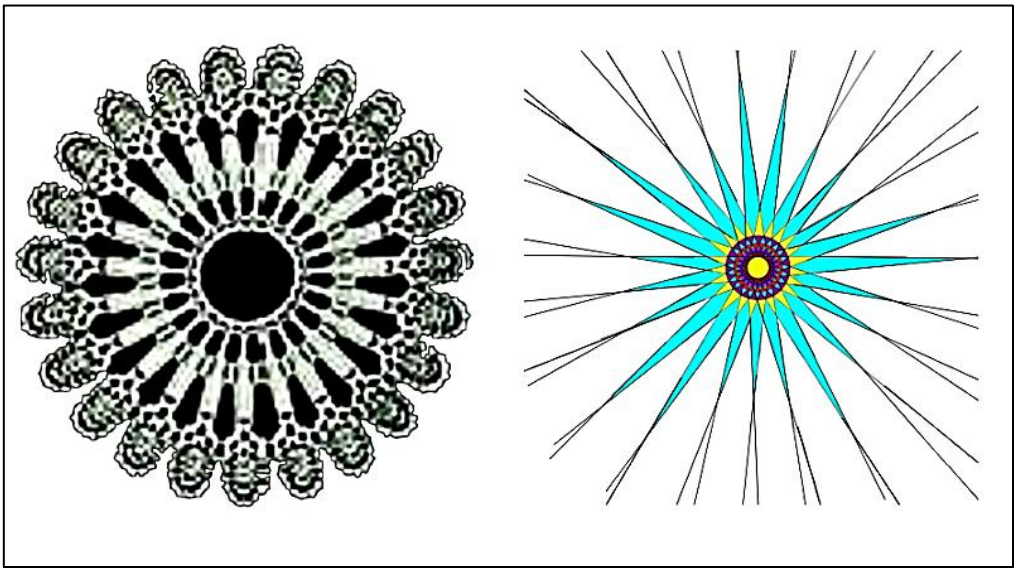
If it is just a shape why do these diatoms seem to select inner harmonics from outer Primary Shapes for their overall construction? If it is 'just a shape' would not the primary outer shape be more likely to produce results?

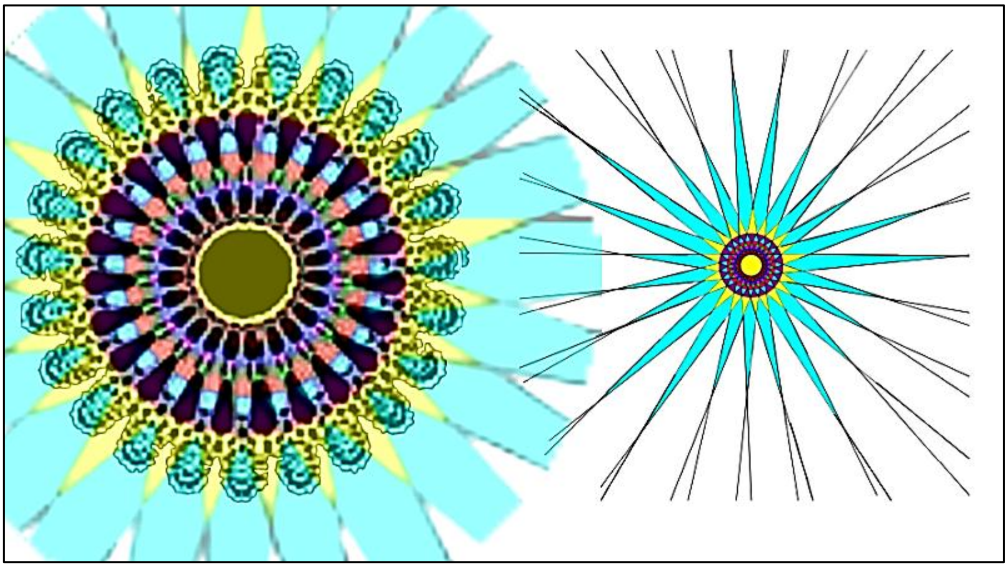
If you cannot see the makings of Stonehenge in this theory you may also have become deaf and blinded to the Harmonic Graphics and Mathematics that reside in:

- *The perpetually 'Silent Sentinel' of the Wiltshire Plains.*
- *The numerous Diatoms of Oamaru in New Zealand.*
- *The remarkable Plane Regular Shapes from Nature.*
- *The impeccable "Water Sound Images" of Alexander Lauterwasser.*
- *The images from Cymatics Experiments of Earnst Chladni and Dr. Hans Jenny.*
- *The melodic frequencies of the scales of Musical Notes.*
- *The irreconciable debate between **frequency** and **shape** in Olefactory research which continues without discovering that they are not mutually exclusive. **Frequency forms Shape**.*



23 POINT IMAGE EXTENDED TO YET ANOTHER HARMONIC LEVEL





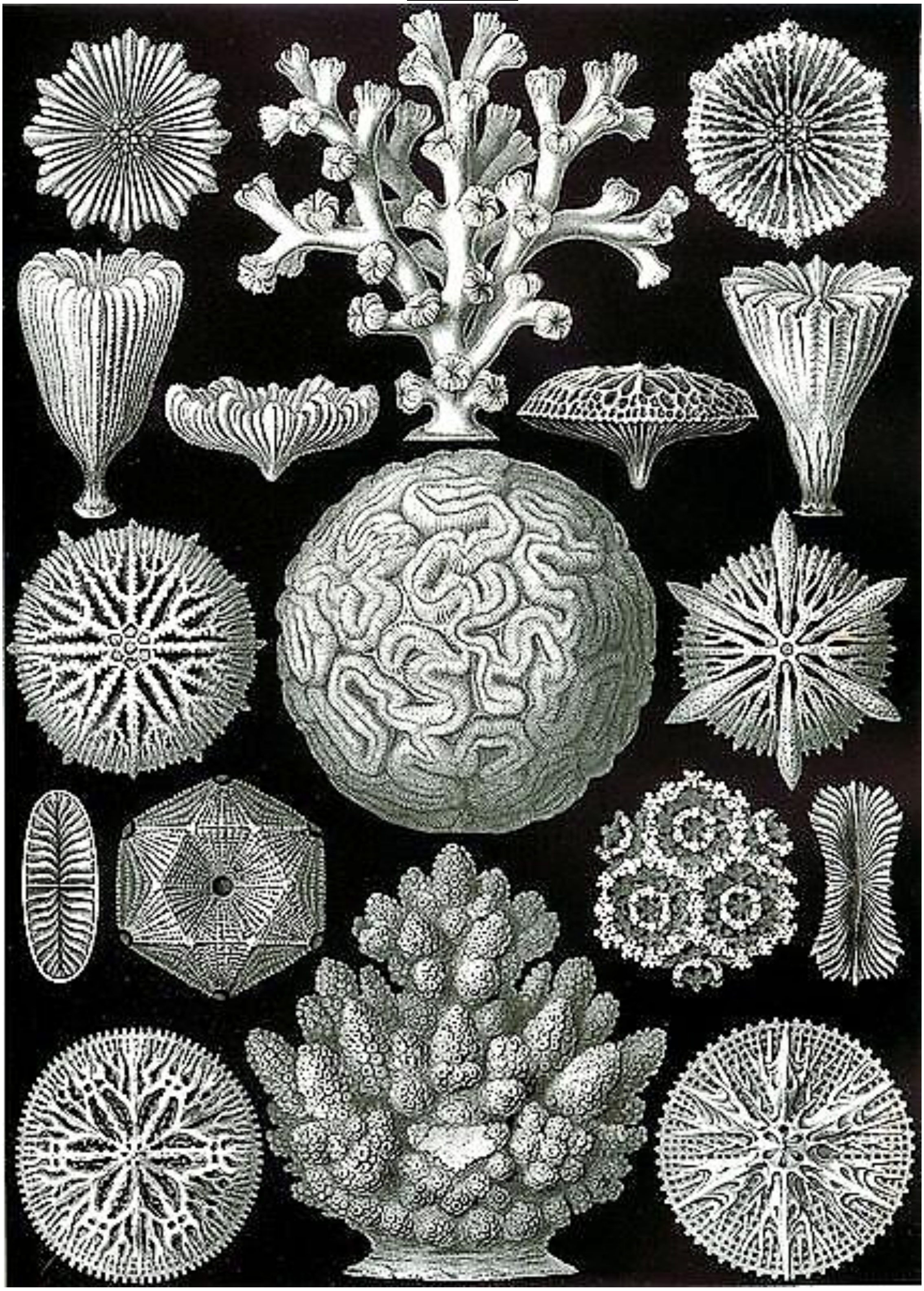
This is the final stage in the extension of this particular shape as any further extension produces lines that spread outwards without meeting again. This blue star is therefore the Primary Shape, a Prime 23 Point Polygram.

When the ramifications of this shape theory becomes obvious to you it will be possible for you to calculate each of the Mathematical Ratios for each of the component harmonics thus converting this harmonious and thought provoking image into a tedious exercise. But, do not despair, as Dirac said "God used beautiful Mathematics."

Are diatoms indications of the oldest application of Mathematics on Earth?
32 – 35 million years ago - (Some are said to be 200 million years old).

File:Haeckel Hexacoralla.jpg - Wikimedia Commons
commons.wikimedia.org 429 × 599

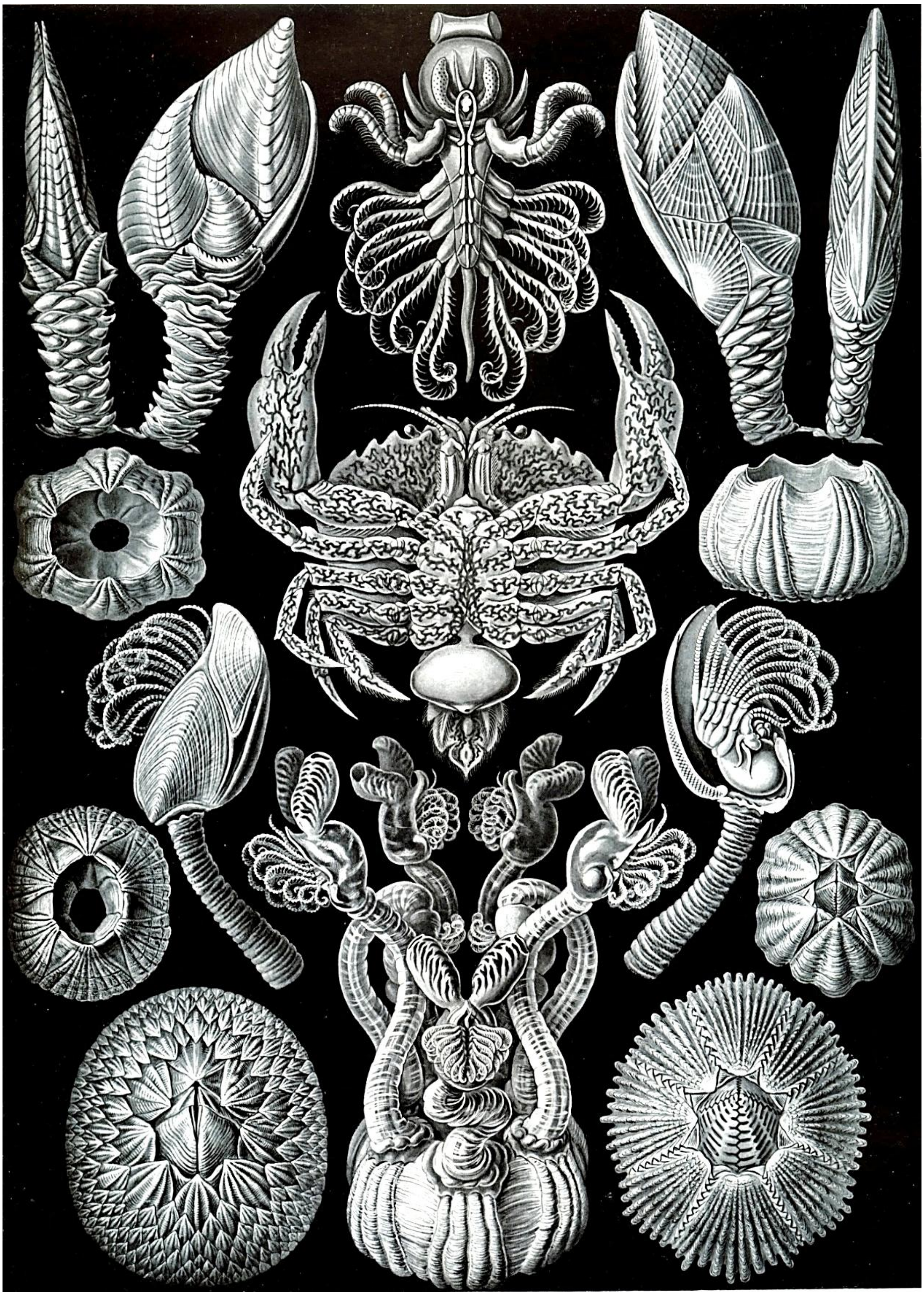
CORALS



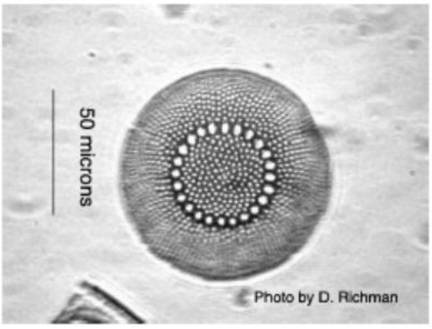
Darwin’s favorite arthropod | Arthropoda

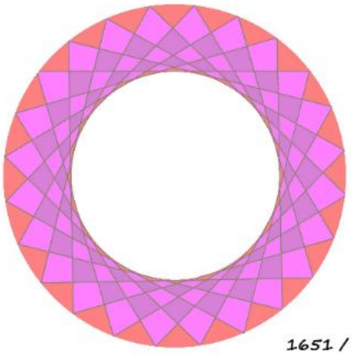
arthropoda.wordpress.com 2351 × 3294

The 24th of November marks the 150th anniversary of the publication of Darwin’s defining work, On the Origin of Species.



BRIGHTWELLIA CORONATA





1651 / 1000

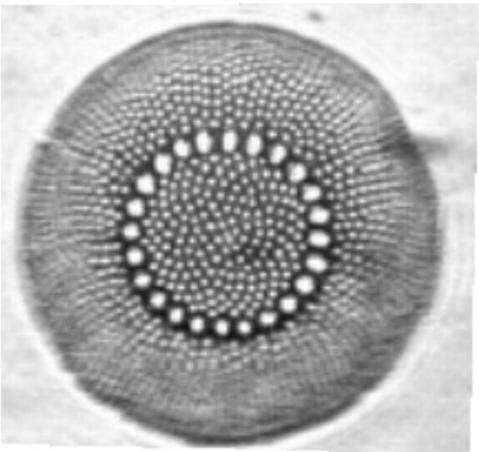
ratio:
1.650647824

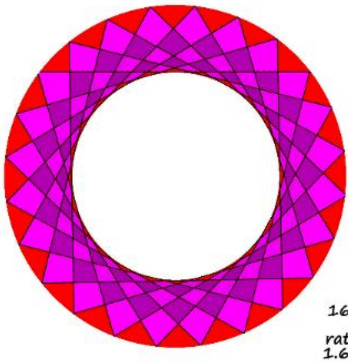
75 degrees

24 points

Brightwellia coronata (Brightwell) Ralfs.
Bains Lower, Oamaru. Ex. Strew
mounted by Klaus Kemp 2007.

24 POINTS ON INTERMEDIATE CIRCLE



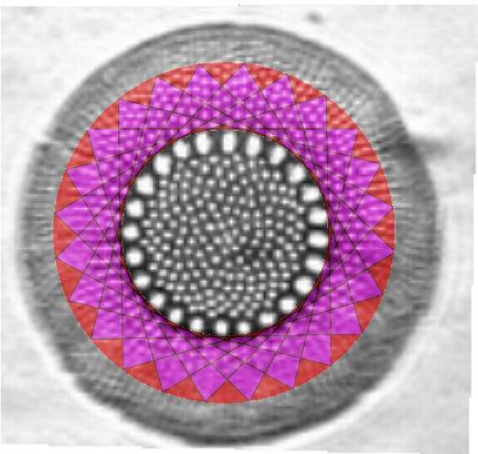


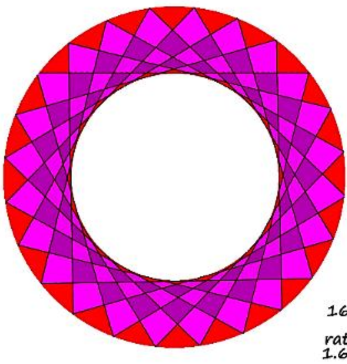
1651 / 1000

ratio:
1.650647824

75 degrees

24 points



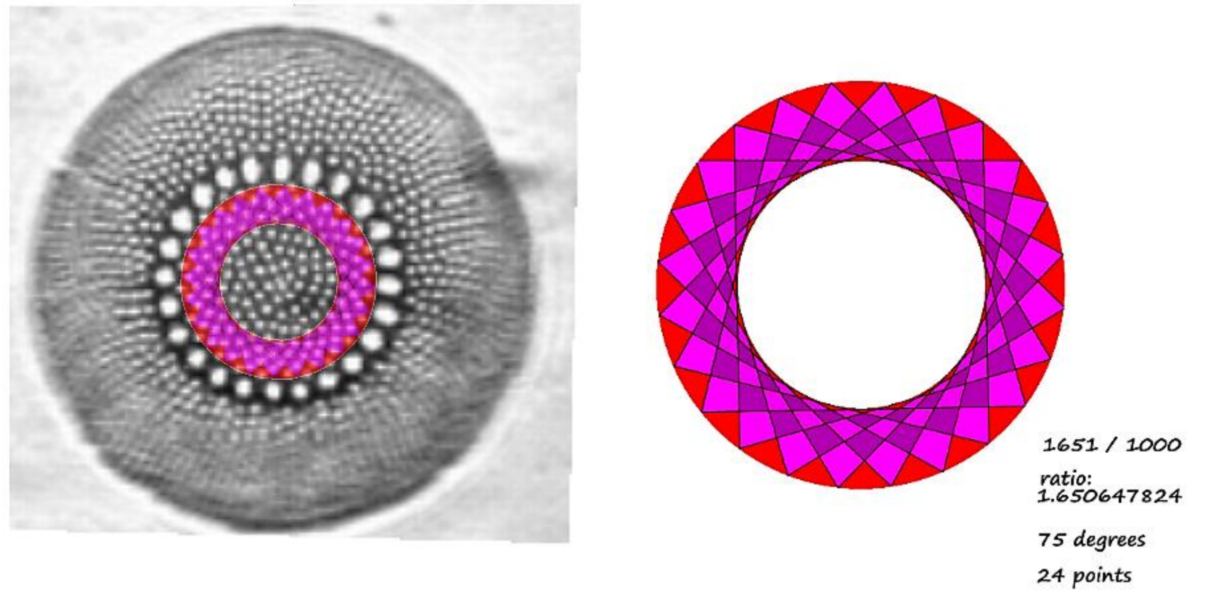


1651 / 1000

ratio:
1.650647824

75 degrees

24 points

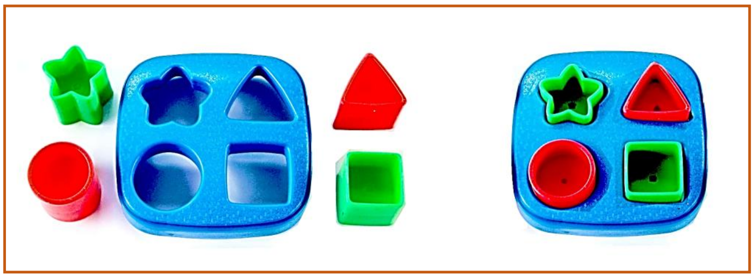


PERHAPS, AT THIS STAGE, WE SHOULD INITIATE AN ASSOCIATION AND FAMILIARITY WITH THE THEORY AND MATHEMATICS OF PLANE REGULAR SHAPE.

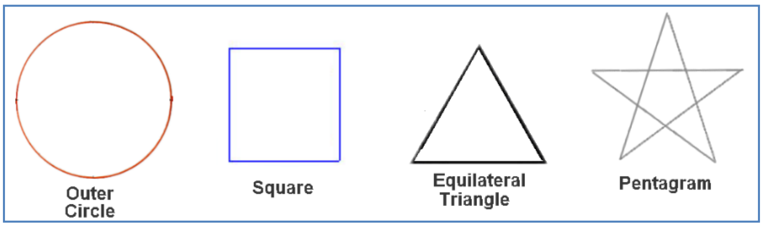
SIMPLIFYING THE THEORY OF THE HARMONICS OF PLANE REGULAR SHAPE

PLANE REGULAR SHAPE - (*All reference to 'Shape' herein is to 'Plane Regular Shape'.)*

Recognize these?

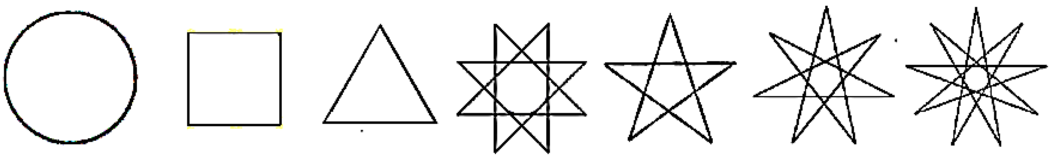


Are these not infants' toy blocks?
But, are they not also the components of the Philosopher's Stone?
And, are they not also the Plane Regular Shapes known as:
The Square; the Circle; the Pentagram; and the Equilateral Triangle.
Perhaps they are also Plato's *Square, Oblong and Five plus the one*.
Or are they just simply Plane Regular Shapes?

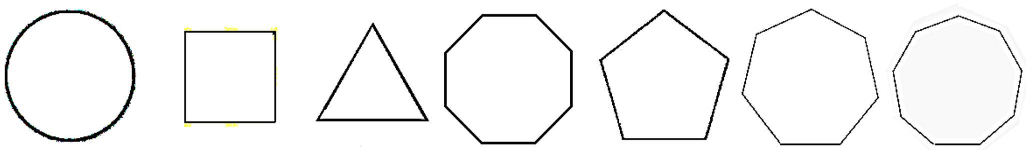


Just four Plane Regular Shapes.

Some more Plane Regular Shapes



The Circle and some Polygrams.



The Circle and some Polygons.

KINDERGARTEN TOYS or PLANE REGULAR SHAPES or THE BUILDING BLOCKS OF NATURE?

I was initially drawn to the amazing features in what is known as Sacred Geometry but I always felt that there should be more than just an unconnected group of startling concepts; it needed a thread to connect all its concepts into an all-inclusive single theory.

I now introduce you to my connecting thread:

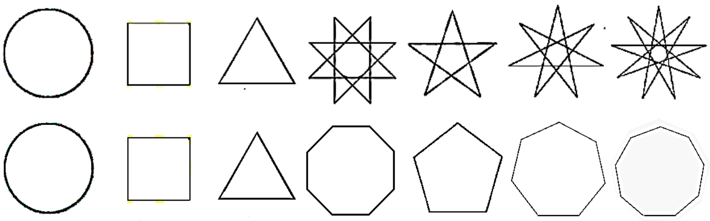
A SIMPLE THEORY OF THE HARMONICS
OF PLANE REGULAR SHAPE

THE UNSEEN RATIOS

This is a theory of the mathematics of Nature that underly the: Harmonics of Plane Regular Shape

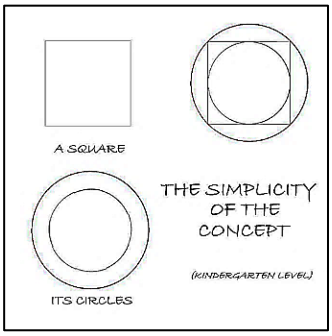
- based on the most simple of concepts;
- hidden in plain sight;
- which have extremely widespread application;
- which have remained invisible to us for at least 5000 years;
- that could answer questions raised since the beginning of time;
- that, although they have really remained unseen, they have been the basis for much science;

Observe Plane Regular Shapes to ascertain their common features:



- Polygons; Polygrams; the circle; the square; and the equilateral triangle.
- Note that they all have some common characteristics:
    - *Naturally, they are all two-dimensional.*
    - *Given, they are all of course equi-angular and equi-lateral.*
    - *They all can have **Circumscribing AND Inscribing Concentric Circles** delineating their outer and inner boundaries. (They are not solids and therefore they also have Inner boundaries.)*
    - *Each Shape has this **pair** of **concentric** circles present in a **Ratio unique** for that shape.*
    - *Physical size of a shape has no effect upon its Ratio – Ratios do not change with size changes.*
    - *These ratios co-exist in a **set** that displays incredible harmonics – the harmonies of Nature.*

The Harmonics that exist within Plane Regular Shape cannot be ascertained from the shapes themselves. Over the centuries many concepts have been illustrated purporting to represent the inner harmonics of some particular shape. They do not and could not purport to represent the harmonics between or within *ALL* Plane Regular Shapes. The only method that indicates the existence of a ***system*** within the harmonics of Plane Regular Shape is that which incorporates the comparison of the Ratios of the shapes derived from the relativity of the dimesions of each shape's Circumscribing Circle to its Inscribing Circle.



Harmonices Mundi - The Shape Ratios

Let us start with the simplest of shapes, the square.

The Square and its Unique Pair of Circles:

Its own unique mathematical Ratio can be determined from the relative size of its Outer to its Inner Circle. This is merely the Ratio of the *diameters* of the circles which can be seen to be also the Ratio of the ***Diagonal*** to the ***Side*** of the square.

The Shape Ratio for the Square is thus √2; or 1.414213562.

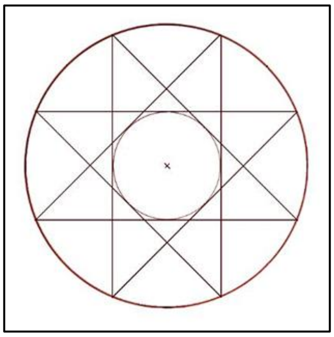
But this square is simply formed by a set of continuous tangents from the Outer Circle to the Inner Circle that start and finish at the same point.

UNDERSTANDING THE CONCEPT OF FORMATION OF A SHAPE USING A CONTINUOUS TANGENT:

This tangent:

- starts at a **point of commencement** on the circumference of the Circumscribing Circle;
- is angled to become a tangent to the Inscribing Circle;
- goes on to be reflected by its natural angle of reflection off the Circumscribing Circle;
- becomes once more a tangent to the Inscribing Circle;
- goes on to be reflected off the Circumscribing Circle by its natural angle of reflection once more;
- and repeats this procedure until it arrives again at the **point of commencement** on the Outer Circle;

Should the continuous tangent never again arrive at the **point of commencement** once more then no plane regular shape can be formed with that pair of circles with that ratio and that angle of reflection. It is only when the continuous tangent is able to arrive again at the **point of commencement** that a shape is formed.



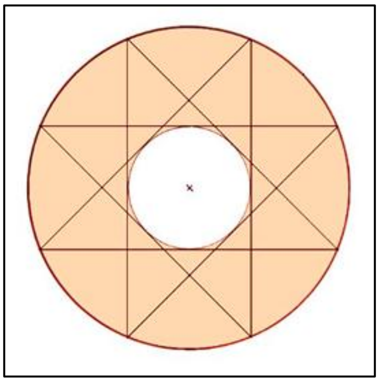
This image is of an Octagram Line Drawing showing how the formation of the shape is the product of a continuous tangent limited in its operation only by the two concentric circles.

The concentric circles are the outer limits of the operation of the continuous tangent as it forms the shape; the circles form what I call the '*dough in the doughnut'*. They are clearly further apart for the Octagram than they are for the Square above. There is therefore more '*dough in the doughnut'* in the Octagram.

THE DOUGH IN THE DOUGHNUT

Understanding the '*Dough in the Doughnut*' concept:

The *dough in the doughnut* represents the limit of the sphere of influence or activity of the shape as it is formed by the continuous tangent. This tangent operates between these two limits to form the shape that is unique to the pair of circles in this particular ratio.

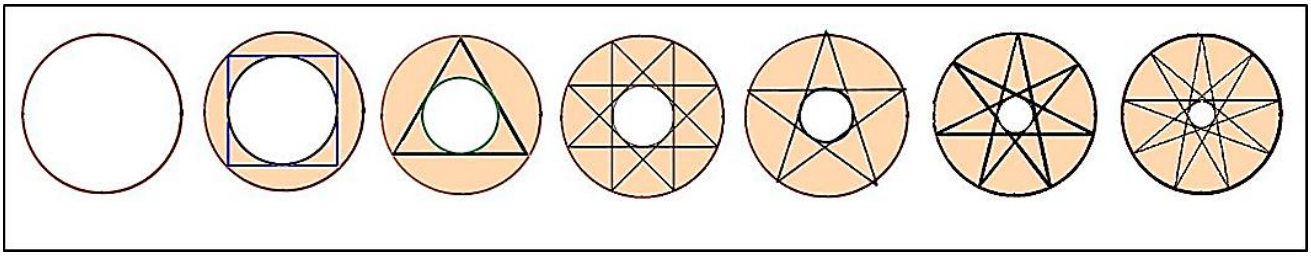


This image shows how all the 'construction' tangents that form the Octagram shape are formed and operate within the area of the 'dough' only.

Wider or narrower widths of 'dough' will form other shapes provided that the continuous construction tangent eventually returns again to the first or original **point of commencement**.

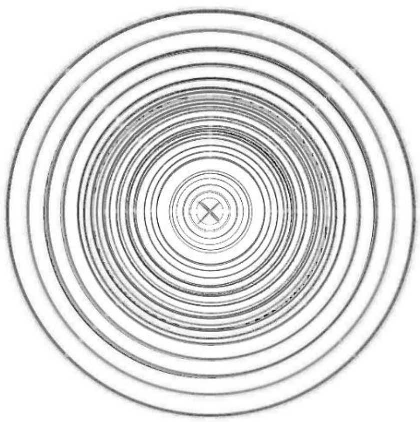
The centre of the inscribing circle is always vacant or empty. Without an **inscribing** circle there would be no shape; so, **without a vacant or empty centre there can be no plane regular shape**. – "*The Hole in the Doughnut".*

ILLUSTRATING THE VARIOUS AMOUNTS OF THE *'DOUGH IN THE DOUGHNUT' AND RELATIVE SIZES OF THE EMPTY CENTRES*.



This is a simple illustration of how various ratios of outer to inner circles will generate various shapes.
It also illustrates the concept that each shape has a ***unique*** ratio derived from its concentric circles.
The smaller the ratio the larger the *empty centre*; the smaller the ratio the larger the *angle at the apex*.
Which also can be listed as the larger the *empty centre* the larger the *angle at the apex*.
The difficulty lies in calculating the mathematical values of the ratios.
Once calculated these ratios would, together with the angles, form the basis of a ***Genome of Shape***.
To take this genome one step further, it could be enhanced by adding frequencies verified by cymatics; or if you like, by Modal Phenomena.

TOUCHING ON THE INFINITE NATURE OF THE HARMONICS



How many Inscribing Circles can exist within a Circumscribing Circle? If a circumference is viewed as being a line without width then the only answer to this question must be 'An Infinite Number" so, in this way, a (circumscribing) Circle may also be seen as being 'Infinite' in its content.

Of all these *infinite possibilities* of Inscribing Circles available within a Circumscribing Circle there are only some that, in conjunction with the Circumscribing Circle and a continuous tangent, form Regular Shapes and it will be seen that they exist in a most uniquely harmonious manner.

The purpose of the exercise is to ***identify*** from the infinite number of available Inscribing Circles *only those* that form Plane Regular Shapes and, if possible, calculate and tabulate their ratios, thus disclosing their harmonics.

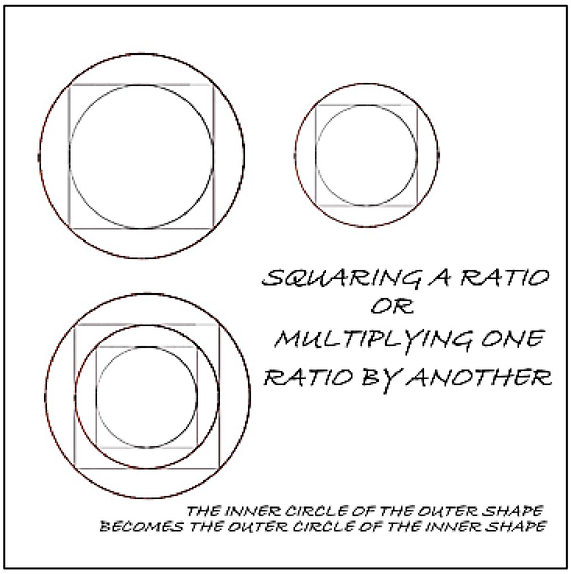
It may be that all Inscribed Circles will produce a shape making the whole concept Infinite.

We started with the Ratio for the ***Square*** which was:	1.414213562	$\sqrt{2}$
Then came the ratio for ***Equilateral Triangle*** which was:	2.000000000	$\sqrt{2} \times \sqrt{2}$
Then we calculated the ratio for the ***Octagram*** which was	2.613125930	$\sqrt{2} \times \sqrt{(2 + \sqrt{2})}$
Then we found the ratio for the ***Octagon*** which was	1.082392200	$\sqrt{2} / \sqrt{(1 + \sqrt{2}/2)}$
And as shown above The ***Octagram x the Octagon*** equals	2.828427125	$\sqrt{2} \times \sqrt{2} \times \sqrt{2}$

A pattern is starting to reveal itself. A major harmonic in Plane Regular Shape is obviously **√2.**

And all of this lead to my earlier hypothesis in defining this theory as being *"Shape x Shape = Shape".*

THE METHODOLOGY OF NESTING SHAPES:



In '*dough in the doughnut*' terms, to graphically multiply a shape by a shape we place a second shape and its circles into the vacant centre of the first shape and its circles. This I call ***'nesting'***. When two squares and their pairs of circles are properly ***'nested'*** we create an intermediate circle and it can now be seen that there are ***three circles*** in the equation:

- The overall Outer Circle
- The overall Inner Circle
- Plus the Intermediate Circle. - (It must be the Inner circle to the Outer shape *and* Outer circle to the Inner shape)

When shapes (*Plus their Circles*) are nested we can then multiply the ratios of the shapes to arrive at the **overall** shape that has the **overall** outer and inner circles as its ratio.

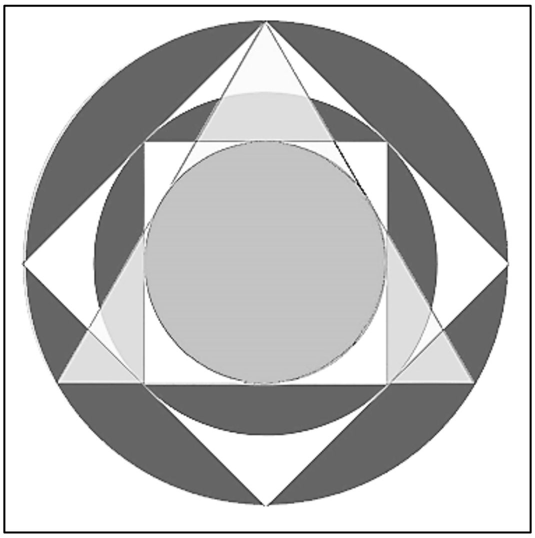
In this case: √2 x √2 = 2. What shape has a Ratio of 2?

(NOTE: *Ratios are multiplied and not added.)*

Appreciating the possible existence of a Theorem:

When graphically multiplying a Shape by a Shape we NEST the shapes and their Circles such that 'The inner circle of the outer shape becomes the outer circle of the inner shape.'

When we utilize the new *overall* Outer and Inner circles found by nesting the two squares and their circles, we find that the application of a continuous tangent now produces an Equilateral Triangle.



So, **graphically** and **mathematically**:

A Square multiplied by a Square equals an Equilateral Triangle.

This was my first major introduction, (utilising the Concentric Circles that define Plane Regular Shape), to the possible existence of a ***system*** of maths, ***graphical maths***, within the '*kindergarten*' world to which Plane Regular Shapes had been demoted.

Mathematically:

If √2 is the ratio for a Square

And √2 x √2 = 2.000000000

Then, 2.000000000 is the shape ratio for an Equilateral Triangle.

SEEKING AND APPLYING MATHEMATICAL SHAPE RATIOS:

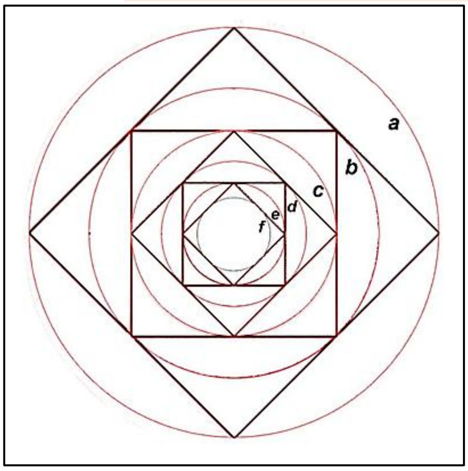
A method of graphically & mathematically multiplying a shape by a shape is invisible to us until we apply the two circles belonging to each shape; its Circumscribing and Inscribing circles.

This method of Graphical Mathematics only becomes visible when the two concentric circles that define the shapes are visible. Without these circles we cannot accurately "nest" the shapes. The various number of angles or apex points of the various shapes do not naturally "nest" within each other. When properly "nested" some or all of the points of the Inner Shape will not be touching the construction lines of the outer shape and yet, mathematically and graphically they could be well 'nested'. It is only the act of applying the circumscribing and inscribing circles that enables correct "nesting" of shapes.

As the shape's Ratio is derived from the shape's outer to inner circles then these circles define the area of influence of the shape; the shape may be rotated around the central point through 360^0 but its construction lines will remain within the area defined by these two circles; thus the *'dough in the doughnut'* concept.

Understanding the Concept of "Ratio" with regard to overall physical Size:

Overall, Mathematically, Physical Size of a shape has absolutely no effect upon its ratio.
Graphically, it is necessary to control the shape's physical size when 'Nesting' shapes.



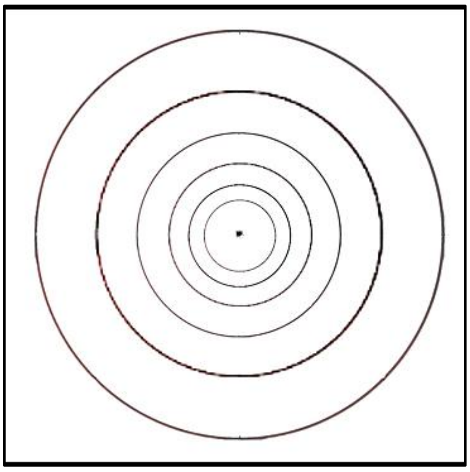
This image illustrates 5 **squares** *nested* with their respective circles.

They are *'nested'* as the outer circle of each inner shape is the inner circle of its respective outer shape.

Each *nested* shape in this image is a square and thus each has a shape ratio of √2 or 1.414213562.

Each inner square is 70.7106781% of the **size** of its outer square but each still has a **shape ratio** of √2 or 1.414213562 as does the outer square.

The ratio from the outer circle to the inner circle is √2 x √2 x √2 x √2 x √2 (or 4 x √2) – **5.656854249 . . .**
(Ratios are multiplied and not added.)

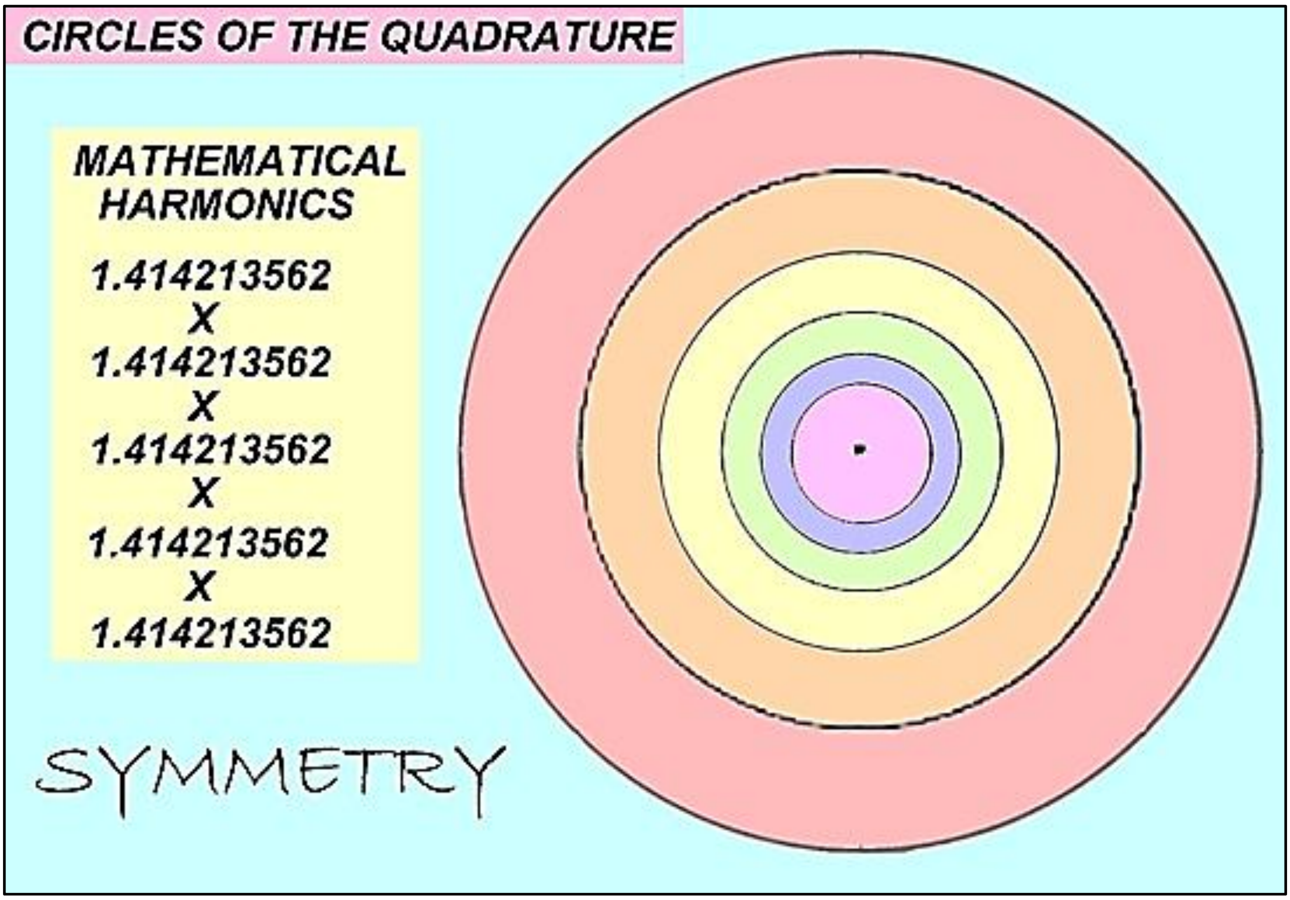


This image is the above image with the Shapes (squares) removed.

As all the shapes between each adjacent pair of circles were squares then <u>each</u> adjacent pair of circles is in the ***ratio*** of √2 or 1.414213562.

But, if we had not just removed the squares, and without knowing the simple methodology of 'nesting' shapes with their circles it is hard to realize that each adjacent pair of circles in this image will form a shape; <u>the same shape</u>: and each adjacent pair of circles is in <u>the same *ratio*</u>. How many ancient rock carvings (and / or Henges) are sets of these concentric circles?

<u>THE IRRELEVANCY OF SIZE or 'AREA'</u>



In this illustration each pair of <u>adjacent</u> circles with its own coloured *'dough in the doughnut'* exist in the shape ratio to each other of √2 or 1.414213562.

In ***<u>Shape Ratio terms</u>*** all of these coloured circular segments are **equal**.

In ***<u>Physical Size terms</u>*** they are clearly **unequal**.

Shape Ratios are therefore independent of the Physical Size of the shape.

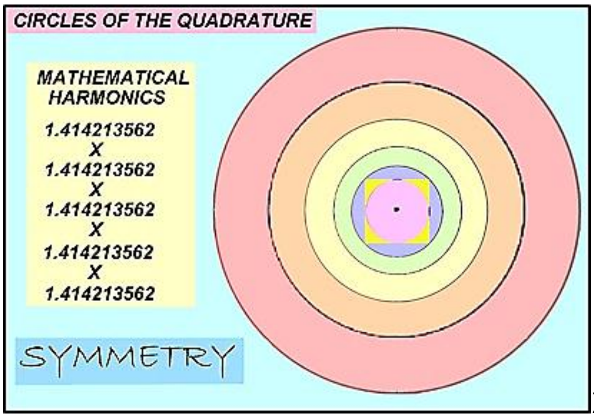
A shape the size of a thimble will have <u>the same ratio</u> as the same shape the size of the Universe.

Do Plane Regular Shape Ratios apply equally both in the **Quantum** world and in the world of the **General Theory of Relativity**?

INTRODUCING A THEOREM:

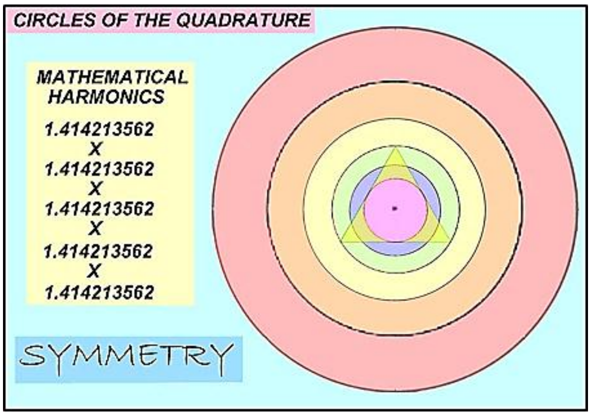
"A Shape Ratio x a Shape Ratio = another Shape Ratio"*. – *(√2 x √2 = 2)

If we use each of these circles in turn as a Circumscribing Circle with *the overall inner circle* as the Inscribing Circle in each case (i.e. as a common Inscribing Circle) we can produce other shapes which have Shape Ratios that are multiples of the ***ratio*** of √2 or 1.414213562.

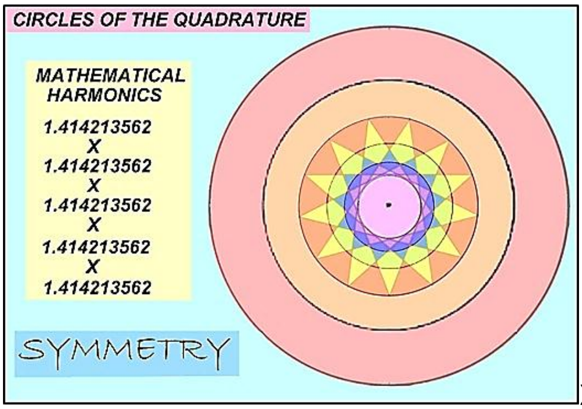


SQUARE – **ratio √2**
Shape ratio 1.414213562

X

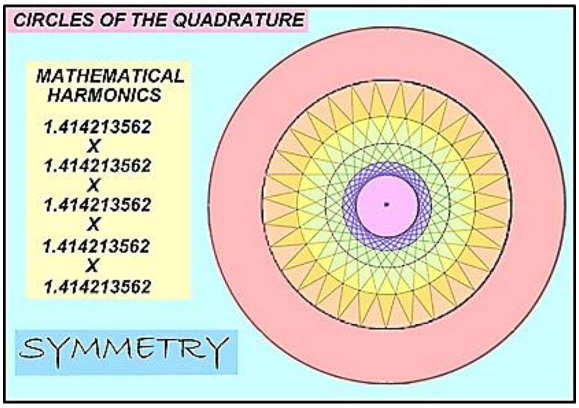


EQUILATERAL TRIANGLE – **ratio √2 x √2**
Shape ratio 2.000000000

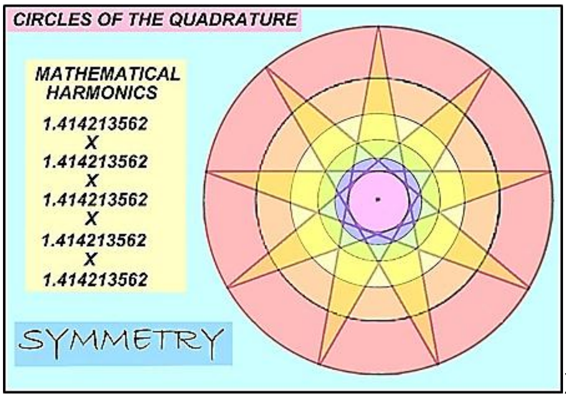


13 POINT POLYGRAM – **ratio √2 x √2 x √2**
Shape ratio 2.828427125

X

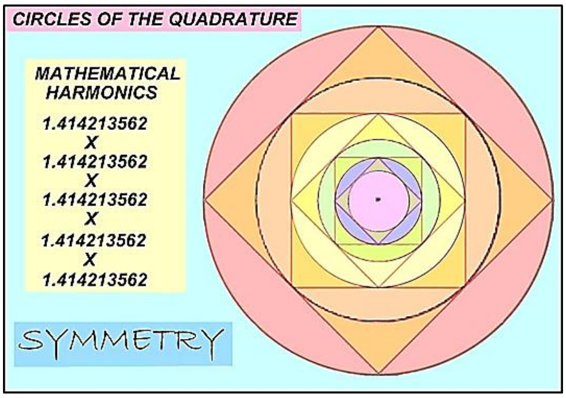


31 POINT POLYGRAM – **ratio √2 x √2 x √2 x √2**
Shape ratio 4.000000000



NONOGRAM – **ratio √2 x √2 x √2 x √2 x √2**
Shape ratio 5.656854249

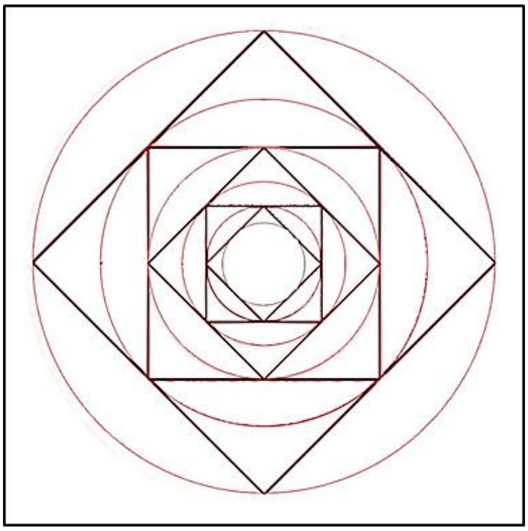
X



THE QUADRATURE – **ratio √2 x √2 x √2 x √2 x √2**
Shape ratio 5.656854249

MY QUADRATURE, AND MEASURING WITHOUT A UNIT OF MEASUREMENT.

X



Throughout history, ancient and modern, the Quadrature has appeared in the construction of structures and in mathematical instruments and calculations without any fanfare; without any acknowledgement of its role in the structures and calculations; without any explanation for its use; and possibly without any knowledge of its hidden harmonic traits. The most we know seems to come from Plato's *Meno*.

Many theories about *Symmetry* are embodied in the repetition of the √2.

$$\sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2} \ldots$$

OR

$$\sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{2} = 32$$

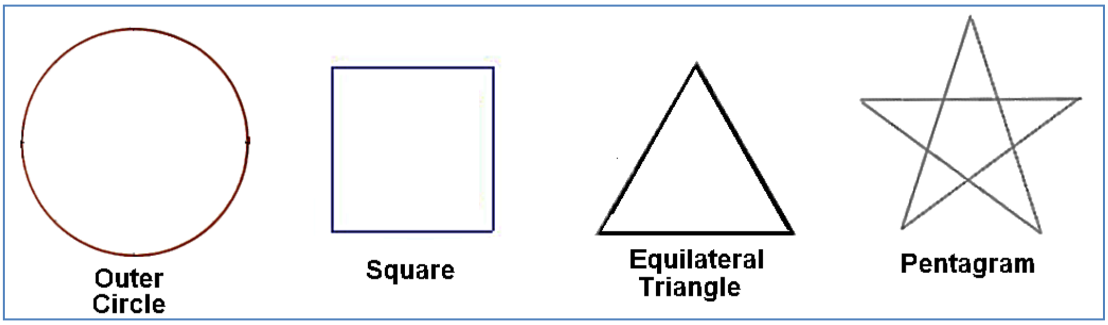
OR

$$2 \times 2 \times 2 \times 2 \times 2 = 32$$

√2 as a ratio must be multiplied, not added.

APPLIED *MATHEMATICAL* THEORY OF PLANE REGULAR SHAPE

At this point we should really allocate **Mathematical** values to each of the Shapes and their Ratios.
Let us look again at **The Philosopher's Stone**, or if you prefer, your child's blocks.

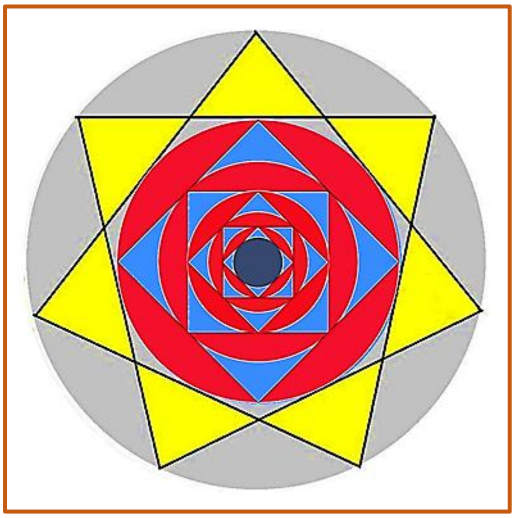


RATIOS:	1.000000000	1.414213562	2.000000000	3.236067978

1.0 x **√2** x **(√2 x √2)** x **(√2 x √2 x Φ)**

1.000000000 x 1.414213562 x 2.000000 x 3.236067978 = **<u>9.152982446</u>**

*If <u>"Shape x Shape = Shape"</u> what shape then has a Ratio of **9.152982446**?*
(√2 x **√2 x √2** x **√2 x √2 x Φ)**



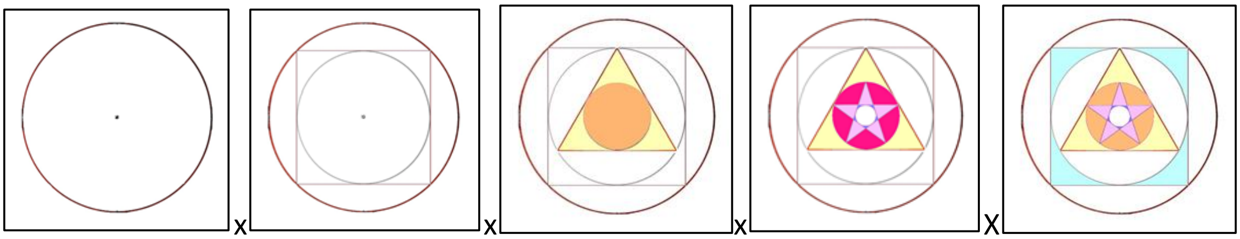
THE ABOVE RATIOS NESTED.
This is a **Graphical** rendition of the **Mathematical Equation.**
Each Square (and its Circles) has a Ratio of **√2.**
The Inner Septagram has a Ratio of **Φ.**
So this is a graphical rendition of **Φ x √2** x **√2 x √2** x **√2 x √2**
As the shapes have all been properly nested, and as "*Shape x Shape = Shape*", we may use the overall outer circle and inner circle to produce a shape. We may also multiply the ratios of the component nested shapes to produce the ratio of the overall shape.
(√2 x **√2 x √2** x **√2 x √2 x Φ)**
The Ratio of the overall outer circle to the overall inner circle is thus **<u>9.152982446.</u>**

Five nested squares represents my Quadrature.
Five nested squares represents my Ratio for the Nonogram.
The image is of five nested squares multiplied by Phi (Golden Mean)

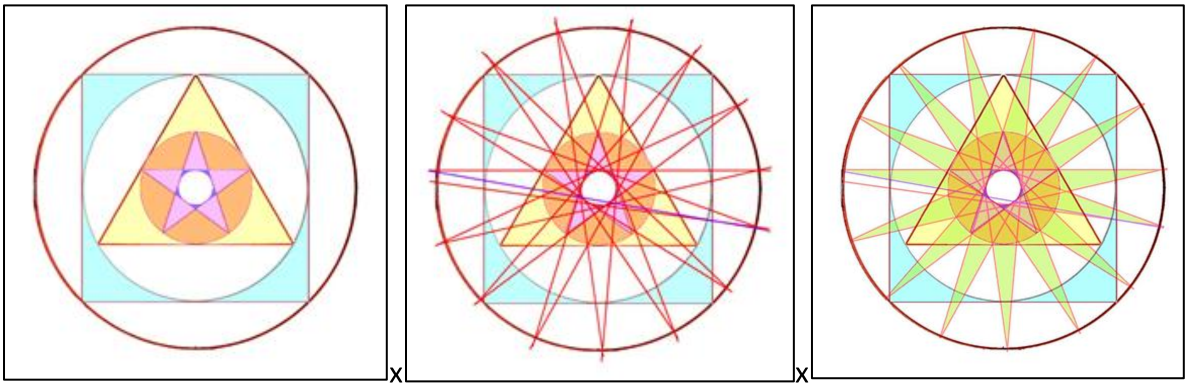
So, as "*Shape x Shape = Shape*", there is also another **Mathematical Harmonic** available here:
Nonogram x Phi = 5.656854249 x 1.618033989 = **<u>9.152982446</u>**
Or
Nonogram x Inner Septagram = 5.656854249 x 1.618033989 = **<u>9.152982446</u>**

APPLIED *GRAPHICAL* THEORY OF PLANE REGULAR SHAPE

NESTING THE PHILOSOPHER'S STONE (or the TOY BLOCKS)



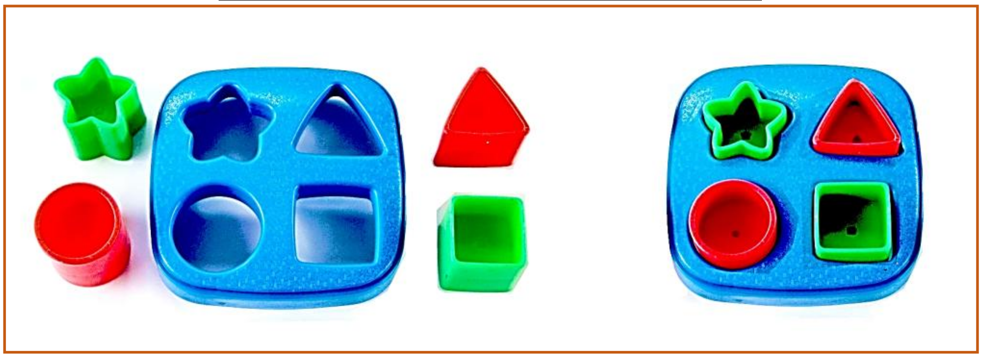
RESULT FROM NESTING THE SHAPES OF THE PHILOSOPHER'S STONE



The tangents in the middle image do not meet at the end because the drawing program only enabled the rotation of a line by **full** degrees. Some angles actually have incommensurable degrees.

I was able to compensate (to some degree) for this inability as I was able to apply another perceived attribute of Plane Regular Shapes. When a shape's number of Apex points is multiplied by the perceived number of degrees and the result is divided by 360 the result is usually a whole number or a whole number plus one-half. This attribute was first noticed when I was converting Polygons to Polygrams.
I called this my ***Index Number****.*

COMPONENTS OF A TOY BLOCK SET



It is a pity that these toy blocks do not each come with their respective pair of Concentric Circles.

DISCOVERING A *MATHEMATICAL* THEORY OF SHAPE

THE START OF A GENOME OF SHAPE

Index	Deg	Shape	Ratio	
Degrees	8			
X	9			
Points	10			
/	11			
360	12	15 pt Primary polygram	9.152982446 plus	
	13	12.5 degrees ?pts	9.152982446	
1, 2, and 0.5	14			
are Primary	15			
Shapes	16			
	17			
1	18	20pts	6.472135954999560	est
1.999961111	19	18.947 deg 38pts	6.111456184000000	VP
0.5	20	20 degrees nonogram	5.656854249492380	
	21		5.545084971874640	VP
1	22	16pts 22.5deg	5.236067977499790	VP
	23		4.944271909999160	VP
2	24	24 degrees 30pts	4.846581983000000	
0.5	25	septagram 25.7142857	4.576491223248880	
	26		4.321452107803630	VP
3	27	40pts	4.236067978000000	
3.5	28	45pts	4.176904000000000	est
2.499999994	29	31pts 29.032258deg	4.000000000000000	
1	30	12pts	3.853220324000000	
2.499999778	31	29pts 31.03448deg	3.702459175000000	
1.499995278	32	17pts 31.76470588deg	3.629305232154990	
11	33	33 degrees 120pts	3.496128197000000	
3.494444444	34	34 degrees 37pts	3.427050986000000	
	35		3.464101616000000	
0.5	36	pentagram	3.236067977499790	
	37			
	38			
	39			
2	40	18pts	2.936169615	VP
1.5	41	13pts 41.53846154deg	2.828427124746190	
	42	56pts 41.78571429	stonehenge	
3.463888889	43	29pts	2.772542489	VP
	44			
1	45	octogram	2.618033989000000	

Index		Deg	Shape	Ratio	
		46			
		47			
4		48	30pts	2.472135954999580	
1.5		49	11pts 49.0909090909	2.423290987000000	VP
5		50	36pts	2.380952381000000	
		51		2.334368543059490	VP
6.5		52	52 degrees 45pts	2.288245610000000	
		53			
3		54	20pts	2.212962963000000	est
11		55	72pts	2.180232558000000	
		56	??	2.160726055	VP
6.491666667		57	41pts	2.118033990000000	
		58			
		59			
0.5		60	Equilateral Triangle	2.000000000000000	
		61			
		62			
7		63	40pts	1.926610162000000	
		64	64.28571429deg 28pts	1.907482035000000	calc
	67	65	72pts	1.888543820000000	
11		66	60pts	1.851229586000000	
		67	16pts 67.5deg	1.847759066000000	calc
		68		1.814652616077490	est
		69	13pts 69.23076923deg	1.748064098502690	calc
6.805555556		70	35pts		
		71	33pts 70.909090deg		
2		72	10pts decagram	1.732050808000000	YES
		73		1.713525493000000	
		74			
		75	24pts	1.650647824000000	
		76	76 degrees 45pts		
		77	7pts ф 77.14285714deg	1.618033989000000	
13		78	60pts	1.572302755514850	VP
		79			
4		80	80 degrees 18pts		
		81	11pts 81.818181deg	1.527864046000000	
		82			
		83			
		84	84 degrees 15pts	1.497676197000000	
		85			
		86			
		87	22.5deg series 45pt	1.448274121000000	est
		88			
		89			
1		90	Square	1.414213562373100	

Index	Deg	Shape	Ratio	
	91			
	92	45pts est ratio	1.386271242968660	VP
	93			
	94			
	95	71pts (95.0704)	1.362319110000000	
	96	30pts	1.349166667	est
	97	13pts 96.923deg	1.335402142000000	dbt
	98	22pts 98.181818deg	1.323746919000000	est
	99	40pts	1.315789474000000	est
	100	inner nonogram	1.309016994000000	
	101			
	102			
	103	14 pt polygram	1.272019649514070	VP
	104			
	105			
	106		1.253914971405500	VP
	107		1.249431391	VP
1.5	108	pentagon	1.236067977499790	
	109			
	110		1.211645495722230	VP
	111			
	112	16pts 112.5deg	1.205357143000000	est
	113			
	114	11pts 114.545454 deg	1.190710563000000	
	115		1.189207115002720	VP
	116			
	117	40pts	1.167184270000000	
	118			
	119			
2	120	hexagon	1.144122806000000	
	121			
	122			
	123		1.127838485561680	VP
	124	45pts est ratio	1.131319763600000	est
	125	13pts 124.75 deg	1.13333 +/-	est
	126	20pts	1.121516995000000	
	127		1.111785940502840	VP
	128	7pts 128.5714 septagon	1.104854344000000	est
	129		1.099943880261110	
	130			
	131			
5.5	132	15pts	1.095+/-	est
	133		1.090507732665260	VP
	134			
3	135	8pts octogon	1.080363027000000	

Index	Deg	Shape	Ratio	
	136			
	137			
	138		1.069636763408670	VP
	139		1.061997403745260	VP
	140	9pts nonogon	1.059016995000000	
	141		1.058198208485710	VP
	142		1.054412604487850	VP
	143			
	144	10pts decagon	1.053333300000000	est
	145			
	146			
	147	147.375deg 11sided	1.047142857000000	est
	148	45pts	1.040719200441880	
	149			
	150	12 sided gon	1.038092722000000	
	151			
	152	152.5deg 13sided	1.033333000000000	est
	153			
	154	14sided gon	1.031027796+/-	est
	155		1.030532582573330	VP
	156	15 sided gon	1.030+/-	est
	157	157.5 deg 16 sided gon	1.020156458000000	
	158			
	159		1.014438521517910	VP
	160		1.014242384554290	VP
	161			
	162	20 sided gon	1.0133333+/-	est
	163			
	164	45 pts		
	165			
	166			
	167			
	168			
	169			
	170			
	171			
	172	45 sided gon		
	173			
	174			
	175			
	176			
	177			
	178			
	179			
-0.5	180	straight line	1.000000000000000	

SOME HARMONICS WITHIN THE *MATHEMATICAL* THEORY OF SHAPE

√5 and its effect on Plane Regular Shape Ratios

				HARMONIC MULTIPLIERS
dark matter Φ	φ	**(√5 - 1) / 2**	0.618033988749895	
16pts 22.5deg 41pts?		**√5 + 3**	**5.236067977499790**	
Septagram	**[(√5 + 1) /√ 2] x 2**	**or {[(√5 + 1) /√ 2] / 2} x 4**	4.576491222541470	1.144122805635370
40pts 27 degrees		**√5 + 2**	**4.236067977499790**	1.080363026950910
pentagram		**√5 + 1**	**3.236067977499790**	1.309016994374950
45 pts 52 deg		**(√5 + 1) /√ 2**	2.288245611270740	1.414213562373100
equilateral triangle	**$\sqrt{2}^2$**	**$\sqrt{2}^2$**	2.000000000000000	1.144122805635370
inner septagram	**Φ**	**(√5 + 1) / 2**	1.618033988749890	1.236067977499790
square	**√2**	**√2**	1.414213562373100	1.144122805635370
inner nonogram		**Φ^2 / 2**	1.309016994374950	1.080363026950910
pentagon		**√5 - 1**	**1.236067977499790**	1.059016994374950
		[(√5 + 1) /√ 2] / 2	1.144122805635370	1.080363026950910
octogon		**{√5 - 1} / { [(√5 + 1) /√ 2] / 2}**	1.080363026950910	1.059016994374950

THE SHAPE THEOREM . . . "SHAPE X SHAPE = SHAPE"

USING A MATRIX TO PRODUCE SHAPE RATIOS

Although the numbers in the left hand columns are based on √5 one is of course the √2.
The multipliers in the remaining columns are based upon the Quadrature each being a multiple of √2.
This Matrix is produced to indicate some of the effect the √5 has upon the shape ratios even though the numbers 5, √5, and √5/2 and their multiples do not seem to produce shapes.
BUT, Plato's concept of "the square of the five less the one" produces far more shapes.

*Matrix of Refined Shape Ratios . . . Refined using Square Roots and the Harmonic **Anthyphairesis** of the **Quadrature***

		square	equilateral triangle	13 pt polygram	31pts 29 degrees	nonogram 20 degrees
	n	**n x √2**	**n x 2**	**n x (2 x √2)**	**n x 2 x 2**	**n x 4.√2**
		1.414213562373100	2.000000000000000	**2.828427124746190**	4.000000000000000	5.656854249492380
(√5 - 1) / 2	0.618033988749895	0.874032048897645	1.236067977499790	**1.748064097795280**	**2.472135954999580**	3.496128195590570
√5 / 2	1.118033988749890	1.581138830084200	2.236067977499790	3.162277660168380	**4.472135954999580**	6.324555320336760
√5 - 1	**1.236067977499790**	**1.748064097795290**	**2.472135954999580**	3.496128195590570	**4.944271909999160**	6.992256391181140
(√5 + 1) / 2	1.618033988749890	2.288245611270750	3.236067977499790	**4.576491222541470**	**6.472135954999580**	9.152982445082950
√5	**2.236067977499790**	3.162277660168390	4.472135954999580	6.324555320336760	8.944271909999160	12.649110640673500
√5 + 1	**3.236067977499790**	**4.576491222541490**	**6.472135954999580**	9.152982445082950	12.944271909999200	18.305964890165900
√5 + 2	**4.236067977499790**	5.990704784914590	**8.472135954999580**	11.981409569829100	16.944271909999200	23.962819139658300
$\sqrt{5}^2$	5.000000000000000	7.071067811865500	10.000000000000000	14.142135623731000	20.000000000000000	28.284271247461900
√5 + 3	**5.236067977499790**	7.404918347287690	**10.472135954999600**	14.809836694575300	20.944271909999200	29.619673389150700
√2	1.414213562373100	**2.000000000000010**	2.828427124746190	4.000000000000000	5.656854249492380	8.000000000000000
Φ^2	**2.618033988749890**	**3.702459173643850**	**5.236067977499790**	**7.404918347287660**	**10.472135954999600**	**14.809836694575300**
		Bluestone Henge at Stonehenge		*Aubrey to Sarsens at Stonehenge*		

Compare the results of the Matrix with the "Genome" to ascertain whether the results are known calculated ratios for shapes.

HARMONIC RELATIONSHIP BETWEEN SHAPE & MUSIC

HERTZ / 100

SORTED BY ↓

SHAPE TO MUSIC CORRELATION

Refined

SHAPE	Note	Music FREQ / 100	Shape Ratios (Ratios including refined results)	Shape Harmonic Multipliers	Shape / Music Differential Harmonics	SUB-HARMONICS WITHIN DIFFERENTIALS: Differential multipliers	Differential sub-multipliers	
Hexagon	A_2	1.100000000000000	1.144122805635360	1.080363026950910	1.040111641486690			
	A_2#	1.165409403795230	1.211645494819790	1.059016994374940	1.039673689669900	1.000421239684280		
Pentagon	B_2	1.234708253140320	1.236067977499790	1.020156458951420	1.001101251535340	1.038530006905300	0.963305087992038	1.038092721055230
Inner Nonogram	C_2	1.308127826503010	1.309016994374940	1.059016994374940	1.000679725523690	1.000421239684280	1.038092721055230	0.963305087992038
Square	C_2#	1.385913154884390	1.414213562373100	1.080363026950910	1.020420043917590	0.980654713211912	1.020156458951420	0.980241796467049
15pts	D_2	1.468323839587070	1.497676196228630	1.059016994374940	1.019990383490480	1.000421239684290	0.980241796467043	1.020156458951420
Golden Mean	D_2#	1.555634918610450	1.618033988749890	1.080363026950910	1.040111641486670	0.980654713211912	1.020156458951420	0.980241796467044
Decagram	E_2	1.648137784564400	1.713525491562400	1.059016994374940	1.039673689669870	1.000421239684280	0.980241796467049	1.020156458951420
	F_2	1.746141157165080	1.748064097795280	1.020156458951420	1.001101251535310	1.038530006905300	0.963305087992039	1.038092721055230
60pts	F_2#	1.849972113558250	1.851229586821910	1.059016994374940	1.000679725523670	1.000421239684280	1.038092721055230	0.963305087992038
Equi Tri	G_2	1.959977179908830	2.000000000000000	1.080363026950910	1.020420043917570	0.980654713211912	1.020156458951420	0.980241796467049
41pts 57.07deg	G_2#	2.076523487899830	2.118033988749880	1.059016994374940	1.019990383490450	1.000421239684280	0.980241796467046	1.020156458951420
45pts 52deg	A_3	2.200000000000120	2.288245611270730	1.080363026950910	1.040111641486640	0.980654713211912	1.020156458951420	0.980241796467046
	A_3#	2.330818807590580	2.423290989639570	1.059016994374940	1.039673689669840	1.000421239684280	0.980241796467046	1.020156458951420
30pts 48deg	B_3	2.469416506280770	2.472135954999580	1.020156458951420	1.001101251535290	1.038530006905300	0.963305087992041	1.038092721055220
Octogram	C_3	2.616255653006160	2.618033988749880	1.059016994374940	1.000679725523640	1.000421239684280	1.038092721055230	0.963305087992039
Stonehenge	C_3#	2.771826309768920	2.828427124746190	1.080363026950910	1.020420043917540	0.980654713211912	1.020156458951420	0.980241796467049
	D_3	2.936647679174300	2.995352392457270	1.059016994374940	1.019990383490430	1.000421239684280	0.980241796467050	1.020156458951420
Pentagram	D_3#	3.111269837221060	3.236067977499770	1.080363026950910	1.040111641486610	0.980654713211918	1.020156458951410	0.980241796467056
	E_3	3.296275569128980	3.427050983124800	1.059016994374940	1.039673689669820	1.000421239684280	0.980241796467055	1.020156458951410
	F_3	3.492282314330350	3.496128195590570	1.020156458951420	1.001101251535260	1.038530006905300	0.963305087992039	1.038092721055230
	F_3#	3.699944227116690	3.702459173643810	1.059016994374940	1.000679725523610	1.000421239684280	1.038092721055230	0.963305087992039
31pts 29deg	G_3	3.919954359817880	4.000000000000000	1.080363026950910	1.020420043917510	0.980654713211912	1.020156458951420	0.980241796467049
	G_3#	4.153046975799880	4.236067977499750	1.059016994374940	1.019990383490400	1.000421239684280	0.980241796467046	1.020156458951420
Septagram	A_4	4.400000000000470	4.576491222541460	1.080363026950910	1.040111641486580	0.980654713211912	1.020156458951420	0.980241796467046
	A_4#	4.661637615181420	4.846581979279140	1.059016994374940	1.039673689669790	1.000421239684280		
	B_4	4.938833012561810	4.944271909999160	1.020156458951420	1.001101251535230	1.038530006905300		
41pts 22deg	C_4	5.232511306012600	5.236067977499760	1.059016994374940	1.000679725523590	1.000421239684280		
Nonogram	C_4#	5.543652619538130	5.656854249492380	1.080363026950910	1.020420043917480	0.980654713211912	sub-multiplier	reciprocal
	D_4	5.873295358348910	5.990704784914500	1.059016994374940	1.019990383490370	1.000421239684290	0.980241796467043	1.020156458951420
	D_4#	6.222539674442450	6.472135954999560	1.080363026950910	1.040111641486560	0.980654713211910	157.5 degrees	16 sided gon
	E_4	6.592551138258310	6.854101966249600	1.059016994374940	1.039673689669760	1.000421239684280		
	F_4	6.984564628661070	6.992256391181140	1.020156458951420	1.001101251535210	1.038530006905300	sub-multiplier	reciprocal
	F_4#	7.399888454233780	7.404918347287620	1.059016994374940	1.000679725523560	1.000421239684280	0.963305087992039	1.038092721055230
	G_4	7.839908719636170	8.000000000000000	1.080363026950910	1.020420043917460	0.980654713211912	150 degrees	12 sided gon

Shape Harmonic Multipliers Pattern	Music Linear Multipliers Pattern
1.080363026950910	1.059463094359300
1.059016994374940	1.059463094359300
1.020156458951420	1.059463094359300
1.059016994374940	1.059463094359300
1.080363026950910	1.059463094359300
1.059016994374940	1.059463094359300
Cumulative Product of above	**Cumulative Product of above**
1.414213562373090	1.414213562373130
Differential	
1.000000000000030	

For this exercise I chose the shape ratio next highest to each of the music note frequencies.

I then divided each Shape Ratio by the Music Note Frequency and obtained what I called *"Shape Harmonic Multipliers"*.

It was clear to see that a pattern existed in these *"Shape Harmonic Multipliers"*.

When the above Spreadsheet is sorted by the “Shape/Music Differentials” column the result is as follows

The Music is sorted into half octaves indicating that the Differentials are organised into “sets” which in turn indicates that there is correlation between Shape and Music as ***Plato*** *was seeking in his theory with* ***Glaucon*** *–* ***the harmony of the sight with the sound****.*

HERTZ / 100

SHAPE TO MUSIC CORRELATION

SORTED BY ↓

Refined

DIFFERENTIALS: 30 — 10,000,000,000,000

SHAPE	Note	Music — NEW, Freq, Hz — Linear — Refined — Linear	Shape Ratios — Ratios including refined results (nearest above) — Harmonic	Shape Harmonic Multipliers	Shape / Music Differential Harmonics	Differential multipliers		
	F_4#	7.399888454233780	7.404918347287620	1.059016994374940	1.000679725523560	Note the differences between the sets		
41pts 22deg	C_4	5.232511306012600	5.236067977499760	1.059016994374940	1.000679725523590	1.000000000000030		
	F_3#	3.699944227116690	3.702459173643810	1.059016994374940	1.000679725523610	1.000000000000030		
Octogram	C_3	2.616255653006160	2.618033988749880	1.059016994374940	1.000679725523640	1.000000000000030		
60pts	F_2#	1.849972113558250	1.851229586821910	1.059016994374940	1.000679725523670	1.000000000000030		
Inner Nonogram	C_2	1.308127826503010	1.309016994374940	1.059016994374940	1.000679725523690	1.000000000000030		
	F_4	6.984564628661070	6.992256391181140	1.020156458951420	1.001101251535210	1.000421239684150		1.000421239684150
	B_4	4.938833012561810	4.944271909999160	1.020156458951420	1.001101251535230	1.000000000000030		↑
	F_3	3.492282314330350	3.496128195590570	1.020156458951420	1.001101251535260	1.000000000000030		
30pts 48deg	B_3	2.469416506280770	2.472135954999580	1.020156458951420	1.001101251535290	1.000000000000030		
	F_2	1.746141157165080	1.748064097795280	1.020156458951420	1.001101251535310	1.000000000000030		
Pentagon	B_2	1.234708253140320	1.236067977499790	1.020156458951420	1.001101251535340	1.000000000000030		
	D_4	5.873295358348910	5.990704784914500	1.059016994374940	1.019990383490370	1.018868353152150	1.018868353152150	1.000000000000030
	G_3#	4.153046975799880	4.236067977499750	1.059016994374940	1.019990383490400	1.000000000000030	↓	↑
	D_3	2.936647679174300	2.995352392457270	1.059016994374940	1.019990383490430	1.000000000000030		
41pts 57.07deg	G_2#	2.076523487899830	2.118033988749880	1.059016994374940	1.019990383490450	1.000000000000020		
15pts	D_2	1.468323839587070	1.497676196228630	1.059016994374940	1.019990383490480	1.000000000000020		
	G_4	7.839908719636170	8.000000000000000	1.080363026950910	1.020420043917460	1.000421239684180	1.000000000000000	1.000421239684180
Nonogram	C_4#	5.543652619538130	5.656854249492380	1.080363026950910	1.020420043917480	1.000000000000030	↓	↓
31pts 29deg	G_3	3.919954359817880	4.000000000000000	1.080363026950910	1.020420043917510	1.000000000000030		
Stonehenge	C_3#	2.771826309768920	2.828427124746190	1.080363026950910	1.020420043917540	1.000000000000030		
Equi Tri	G_2	1.959977179908830	2.000000000000000	1.080363026950910	1.020420043917570	1.000000000000030		
Square	C_2#	1.385913154884390	1.414213562373100	1.080363026950910	1.020420043917590	1.000000000000030		
	E_4	6.592551138258310	6.854101966249600	1.059016994374940	1.039673689669760	1.018868353152150	1.018868353152150	1.000000000000030
	A_4#	4.661637615181420	4.846581979279140	1.059016994374940	1.039673689669790	1.000000000000030		↓
	E_3	3.296275569128980	3.427050983124800	1.059016994374940	1.039673689669820	1.000000000000030		
	A_3#	2.330818807590580	2.423290989639570	1.059016994374940	1.039673689669840	1.000000000000030		
Decagram	E_2	1.648137784564400	1.713525491562400	1.059016994374940	1.039673689669870	1.000000000000030		
	A_2#	1.165409403795230	1.211645494819790	1.059016994374940	1.039673689669900	1.000000000000030		
	D_4#	6.222539674442450	6.472135954999560	1.080363026950910	1.040111641486560	1.000421239684150		1.000421239684150
Septagram	A_4	4.400000000000470	4.576491222541460	1.080363026950910	1.040111641486580	1.000000000000030		
Pentagram	D_3#	3.111269837221060	3.236067977499770	1.080363026950910	1.040111641486610	1.000000000000020		
45pts 52deg	A_3	2.200000000000120	2.288245611270730	1.080363026950910	1.040111641486640	1.000000000000030		
Golden Mean	D_2#	1.555634918610450	1.618033988749890	1.080363026950910	1.040111641486670	1.000000000000020		
Hexagon	A_2	1.100000000000000	1.144122805635360	1.080363026950910	1.040111641486690	1.000000000000030		

Further analysis indicated that the values of each differential in each set of similar differentials was slightly different in value to the next (a variance in my work of about 0.000000000000030 per differential) which gave order to the complete exercise. I can only contribute this variance to the impossibility of exactly calculating the music frequencies as they are based on the 12th. Root of 2 which is incommensurable and thus can never be calculated exactly. But, the more exact we try to make this number, we merely move further down the line to Infinity which, of course, can never be reached. As it can never be reached we can never be rid of a variance which therefore remains to give order to the universe.

CONSTRUCTING A 'GENOME' OF SHAPE

In the science of Cymatics (or if you wish 'Modal Phenomena') in order to know in advance what shape will be present when a certain frequency is applied, we really need to develop a Genome or List of shapes and their frequencies. Is this not the Science of Plato's **Two Harmonies** if we replace Shape for his Astronomy? Kepler did.

Devise a Method to numerically categorize these Unique Ratios:
(Using their characteristics) –

- **Degrees** at points;
- The **Shape**;
- The Shape's **Ratio**;
- Equivalent Audible **Frequency;**
- Even perhaps its applicable **Diatom;**
- Perhaps an applicable **Crystal;**
- Perhaps an applicable **Atomic Mass;**
- Perhaps ***(PHYSICAL EXAMPLES OF ENTANGLEMENT)?***

These ratios or numbers are not randomly selected numbers such as those used for simulation theory but are real, applicable numerical ratios derived from the shapes and their concentric circles that actually can be used to produce graphically as well as represent or simulate mathematically, the shapes.

- A number is obtained by dividing the shape's Outer Circle by its Inner Circle; As circles can be defined simply by the length of their diameters (all other entities being common to both circles) then the ratio of one diameter to the other diameter provides the ratio of one circle to the other. NB: No **AREA** calculations are required or used. - (*more like Euclid's Line Ratios?*).
- No use of **π** (Pi) is required even though we are dealing with circles.
- These Numbers epitomize the shapes both mathematically and graphically.
- They control and represent the angles present in the points; in a reciprocal relationship except in the area of Dark Matter where they have crossed the Singularity and they exhibit an inverse orientation and become the reciprocal of the reciprocal. *In the area of Dark Matter the Outer Circle then becomes the Inner and the Inner Circle then becomes the Outer.*

  Is this reversing the roles of the strong and the weak forces? A *Reciprocal Universe?*
- The ratios can be the basis of a system of purely ***graphical mathematics***.
- The ratios constitute a system that is the epitome of *Visual Mathematics.*

OTHER CONCEPTS WITHIN THE THEORY

- Firstly, accept that Cymatics produces **Plane Regular Shapes** and not just *"--- ness or "--- fold Symmetries"*.
- Devise a Method to discover the Harmonics both graphical and mathematical that exist within Shape Ratios and between Music Notes and Shape Ratios.
- Use this Method to accurately compare Music Note Frequencies with Shape Ratios to confirm the research of Dr. Hans Jenny and the results from his "Cymatics" experiments.
- From this Method ascertain the correlation between Music and Shape (sought after by Ptolemy Claudius and by Johannes Kepler) and correctly align the ratios and frequencies of the two entities.
- Discover the Harmonics that exist between Music, Shape and Square Roots of Integers.
- Discover the natural code that exists (2-1-2-0.5) that enables us to convert a numerically ordered list of Polygons into a list of Primary Polygrams. (*cf.Cantor's Continuum*)
- Discover thereby the true nature and effect and extent of the Square Root of Two on harmonics.
- Ascertain whether Physicists who are utilising "*Audible Frequencies"* for excitation purposes are influencing the results of their tests through being unaware of the shape that is being formed cymatically by the frequency being used.
- Ascertain whether Physicists who are working in the field of Olefactory Research would be in error if they continued the "*Shape versus Frequency"* debate as it is obvious that these are not mutually exclusive inputs
- Low frequency "noise" could well be caused by shapes that exist at that low frequency.
- If testing for 'shape' results with cymatics experiments then low frequency filters should not be used as many shapes seem to exist in this area of the spectrum.
- Realize that shape is not measured in *units of measurement* but is defined by its own unique Ratio.
- With the exception of 2 and integer multiples of 2 all Plane Regular Shape Ratios are <u>Infinite</u> Irrational or incommensurable numbers that form <u>Finite</u> shapes.

AN *"INNOVATION"* TASK:

- Because *<u>"A Shape Ratio x a Shape Ratio = another Shape Ratio</u>"* then shape ratios may be derived with the use of a Matrix *ad infinitum*.
- Results of a matrix of shape ratios may be utilised in generating and identifying shapes by computer *ad infinitum* thus enabling the computer to produce a 'genome' of shape *ad infinitum*.

SOME THEOREMS &/or FEATURES INDICATED BY THIS THEORY:

"A Shape Ratio x a Shape Ratio = another Shape Ratio".

A method of graphically &/or mathematically multiplying a shape by a shape is invisible to us until we apply the two circles to each shape; the Circumscribing and the Inscribing Concentric circles; and learn to calculate their ratios.

When graphically multiplying a Shape by a Shape we NEST the shapes and their Circles such that 'The inner circle of the outer shape becomes the outer circle of the inner shape.'

"If in a set of three or more concentric circles a Shape Ratio exists between each adjacent pair of Concentric Circles then a Shape Ratio will exist between any pair of these circles."
(MY STONEHENGE THEOREM)

Overall Physical Size of a shape has absolutely no effect upon its ratio.

A shape the size of a thimble will have the same ratio as the same shape the size of the Universe.

A natural code exists (2-1-2-0.5) that enables us to convert a numerically ordered list of Polygons into a list of Primary Polygrams. – *(cf. Cantor's Continuum Hypothesis)*

A Primary Polygram is one that when its sides (or tangents) are extended outwards they form parallel lines or radiate out into space without meeting again to form another segment of the original shape. They may meet other stray lines in space.

A Primary Polygram may contain all other polygrams of its own denomination as well as other harmonic inner shapes.

Because *"A Shape Ratio x a Shape Ratio = another Shape Ratio"* **then shape ratios may be derived with the use of a Matrix. Shape Ratios may also be divided in a Matrix.**

Continuous results of matrices of shape ratios may be utilised in generating and identifying shapes by computer *ad infinitum* **thus enabling the production of a 'genome' of shape** *ad infinitum***.**

With the exception of 2 and integer multiples of 2 all Plane Regular Shape Ratios are *Infinite* Irrational or incommensurable numbers that form *Finite* shapes – providing the border crossing from the infinite to the finite worlds. Can we also apply this *border crossing* **concept to Music and other compatible entities and senses.**

When 'half an octave' of ***Music*** Ratio multipliers are multiplied together the reult is **1.414213559495490.**

Linear Multipliers	**Music**
1.059463094359300	
1.059463094359300	1.122462047548050
1.059463094359300	x
1.059463094359300	1.122462047548050
1.059463094359300	x
1.059463094359300	1.122462047548050
n1 x n2 x n3 x n4 x n5 x n6	1.414213562373130

When 'half an octave' of ***Shape*** Ratio multipliers are multiplied together the result is **1.414213562373090.**

Harmonic Multipliers	**Shape**
1.080363026950910	
1.059016994374940	1.144122805635360
1.080363026950910	x
1.059016994374940	1.144122805635370
1.020156458951420	x
1.059016994374940	1.080363026950910
n1 x n2 x n3 x n4 x n5 x n6	1.414213562373090

When 'half an octave' of ***Square Root*** Ratio multipliers are multiplied together the result is **1.414213562373090.**

Harmonic	**Square Root**
Sq. Rt Multiplier Pattern	
1.069044967367660	
1.060660172059640	
1.054092553389460	
1.048808848170150	
1.087114613009220	
1.037749043325540	
n1 x n2 x n3 x n4 x n5 x n6	1.414213562373090

1.059463094359300
1.059463094359300
1.059463094359300
1.059463094359300
1.059463094359300
1.059463094359300

1.080363026950910
1.059016994374940
1.080363026950910
1.059016994374940
1.020156458951420
1.059016994374940

1.069044967367660
1.060660172059640
1.054092553389460
1.048808848170150
1.087114613009220
1.037749043325540

Each of these sets of 'Harmonic' Multipliers appears at first to have absolutely no relevence to the other two sets.
The Music set is Linear.
Shape and Square Root sets are Harmonic.

No number in one set is repeated in either of the other two sets.

A feature in common is that each set's pattern repeats and is made up of six numbers, "half an octave".

Note how the products of the multiplication of each "half octave" come within one-three-billionth of the square root of two and of each other.
BUT the overall result is that, regression analysis aside, there is undoubtedly a correlation between applicable ratios for Music, Shape & Square Roots.
Now for the Planets and the Universe, according to Timaeus & Kepler.

NOTE: *The "obvious" application of Plato's Odd, Even, and the Square of 5 plus the one.*

Ratios formed around the Golden Mean		
not a shape	2.236067977499790	√5
Pentagon	1.236067977499790	(√5) - 1
Golden Mean	0.618033988749890	((√5) - 1) / 2
Inner Septagram	1.618033988749890	1 + (((√5) - 1) / 2)
Pentagram	3.236067977499790	(1 + (((√5) - 1) / 2)) x 2
Septagram	4.576491222541470	((1 + (((√5) - 1) / 2)) x 2) x √2
Inner Nonogram	1.309016994374940	((1 + (((√5) - 1) / 2))²) /2

The Ratios for the Seven Concentric Circles are divided such that one-half (3) are formed around the Golden Mean (above) and one-half (3) are formed around the Square (below).

Ratios formed around the Square		
Square	1.414213562373100	√2
Equilateral Triangle	2.000000000000000	√2 x √2 or √4
Stonehenge	2.828427124746190	√2 x √2 x √2 or 2 x √2
Nonogram	5.656854249492380	√2 x √2 x √2 x √2 x √2 or 4 x √2

Golden Mean - ϕ	0.618033988749890	((√5) - 1) / 2

	Vesica Piscis Ratios	
The Singularity	1.000000000000000	The Singularity
Pentagon	1.236067977499790	(√5) - 1
Inner Nonogram	1.309016994374940	(1 + (((√5) - 1) / 2)) / 2
Square	1.414213562373100	√2
Inner Septagram Φ	1.618033988749890	1 + (((√5) - 1) / 2)
Equilateral Triangle	2.000000000000000	√2² or √4

The Vesica Piscis Ratios may be produced graphically without Arithmetic

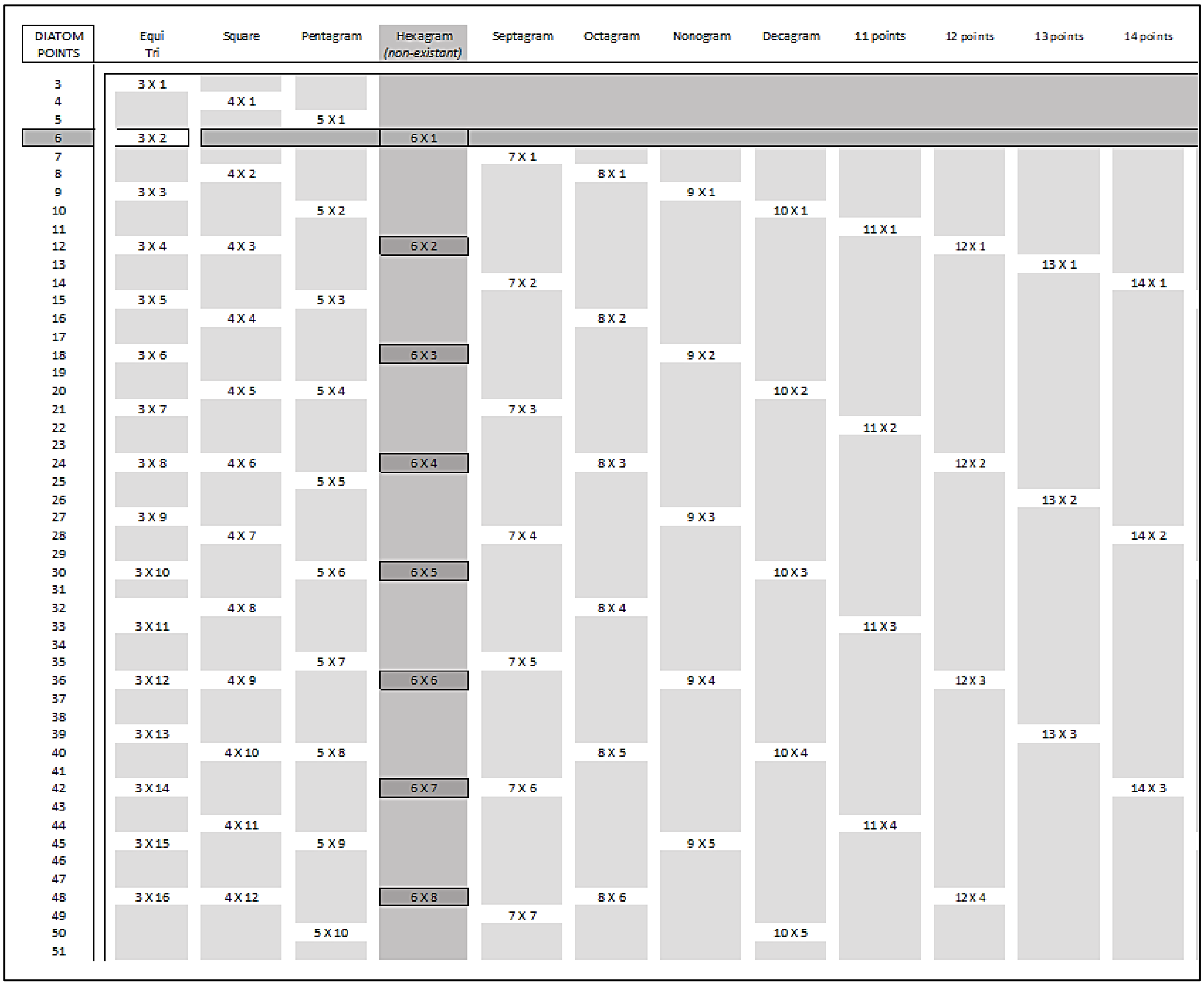
	Stonehenge Ratio	
Stonehenge	2.828427124746190	2 x √2

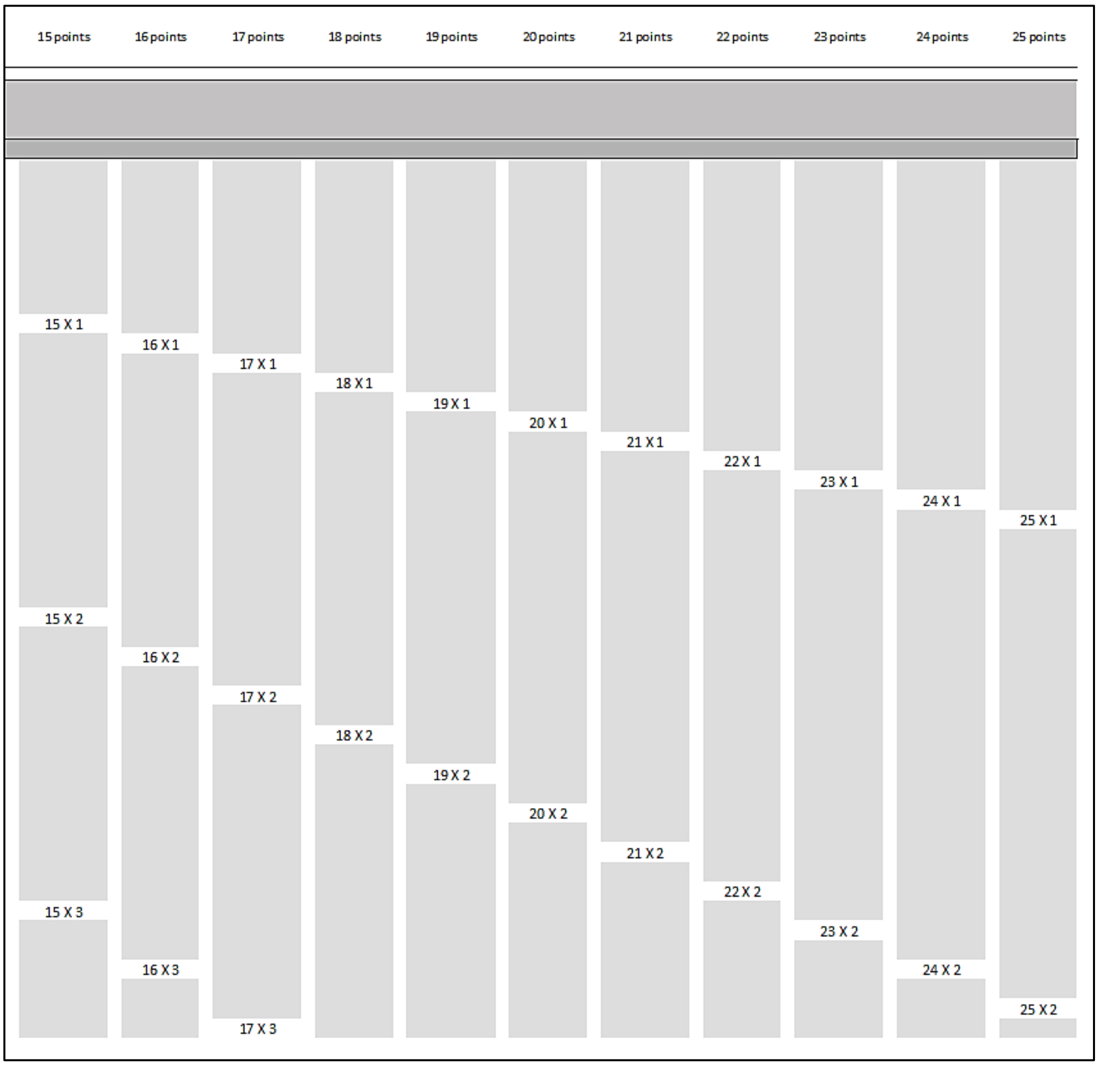
Stonehenge also incorporates the Vesica Piscis Ratios

	Seven Concentric Circles Ratios	
Square	1.414213562373100	√2
Equilateral Triangle	2.000000000000000	√2² or √4
Pentagram	3.236067977499790	(1 + (((√5) - 1) / 2)) x 2
Septagram	4.576491222541470	((1 + (((√5) - 1) / 2)) x 2) x √2
Nonogram	5.656854249492380	4 x √2

The Seven Concentric Circles Ratios are formed from the Vesica Piscis Ratios

DIATOM DENOMINATIONS AND POSSIBLE PRIME HARMONICS

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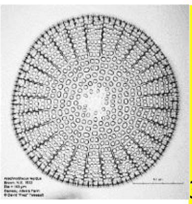
19 X 1
19 X 2
20 X 1
20 X 2
21 X 1
21 X 2
22 X 1
22 X 2
23 X 1
23 X 2
24 X 1
24 X 2
25 X 1
25 X 2

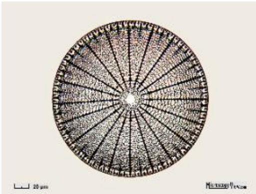
DIATOMS AND PRIME NUMBERS

“Prime Numbers in Nature” . . . DR. MARCUS Du SAUTOY

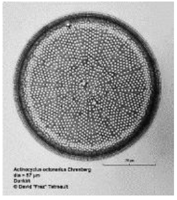
DIATOM IMAGES MARSHALLED BY DENOMINATIONS



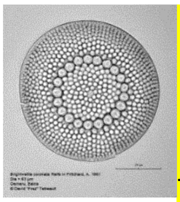
3 / 9 / 27 / points X



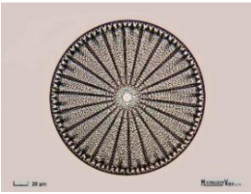
5 / 10 / 20 points X



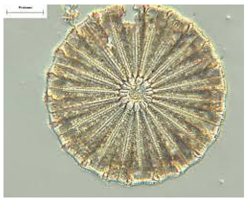
7 / 14 points



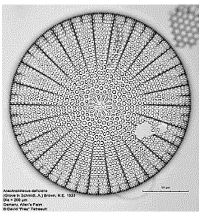
7 / 21 points X



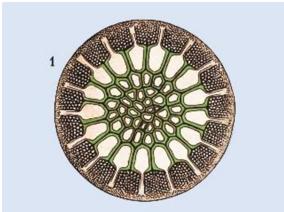
11 / 22 / 44 points X



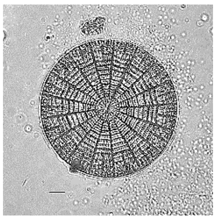
11 / 22 points



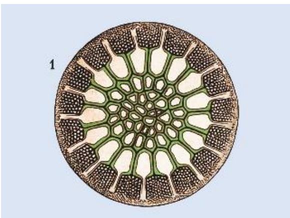
13 / 26 / 52 points X



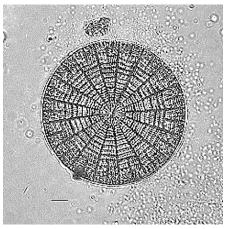
17 points X



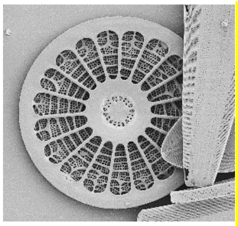
17 / 34 points



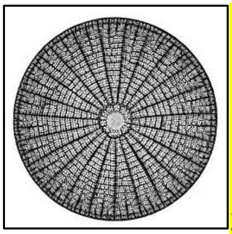
17 points X



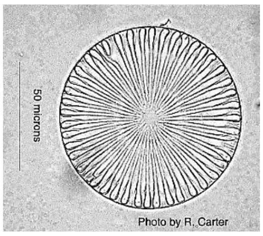
17 / 34 points X



19 / 38 points

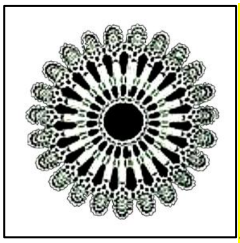


23 / 46 pts X

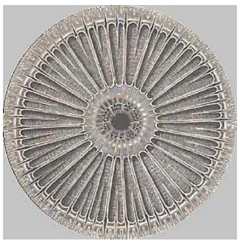


23 / 46 pts X

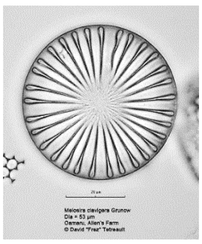
23 / 46 pts



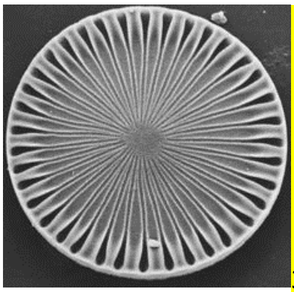
23 POINTS X



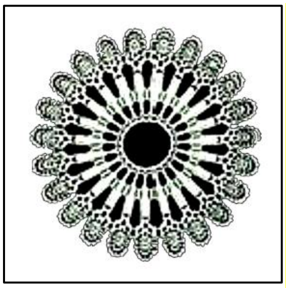
29 points X



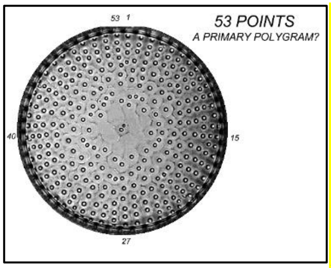
31 points



37 POINTS x



23 POINTS



53 POINTS PRIME

ARE 'DISCUS' DIATOM DESIGNS ALL DERIVED FROM PRIME NUMBERED SHAPES?

PRIME NUMBERS

A prime number is a natural number greater than 1 that cannot be formed by multiplying two smaller natural numbers. A natural number greater than 1 that is not prime is called a composite number.

When a number has more than two factors it is called a composite number. Here are the first few **prime numbers**:
2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193, 197, 199, etc.

DIATOMS

COSCINODISCUS AND ARACHNOIDISCUS

DIATOMS LOCATED WITH PRIME NUMBER OF IDENTIFIED POINTS OR APEXES:

2, **3, 5, 7, 11, 13, 17, 19, 23**, **29**, **31**, **37**, **53, 67,**

DIATOMS WITH A PRIME NUMBER STILL TO BE LOCATED

41, 43, 47, 59, 61, 71, 73, 79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193, 197, 199, etc.

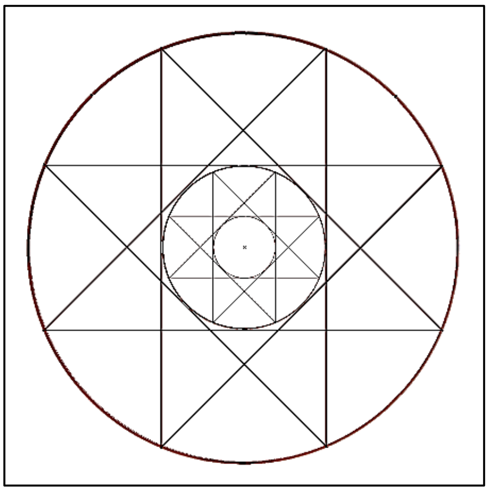
DIATOMS LOCATED WITH NON-PRIME NUMBER OF IDENTIFIED POINTS OR APEXES:

4, 8, 9, 12, 38,
But 9 = 3 x 3 and 12 = 4 x 3 and 3 is a Prime Number.
And 38 = 19 x 2 and 19 is a Prime Number and has been found as a Diatom.

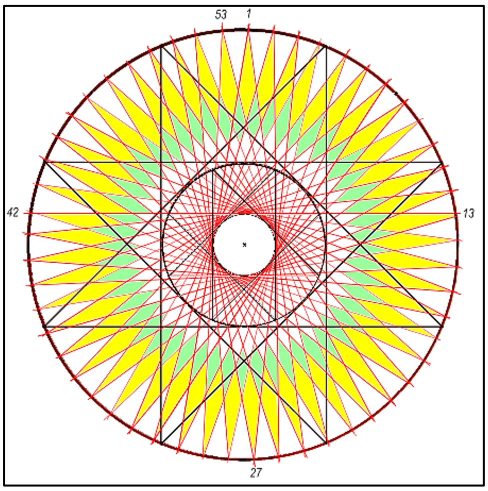
ARE THESE DIATOMS ALL FORMED WITH FEATURES REPRESENTING PRIMARY PLANE REGULAR SHAPES?

ARE PRIME NUMBERED DIATOMS FORMED WITH PRIMARY SHAPES?

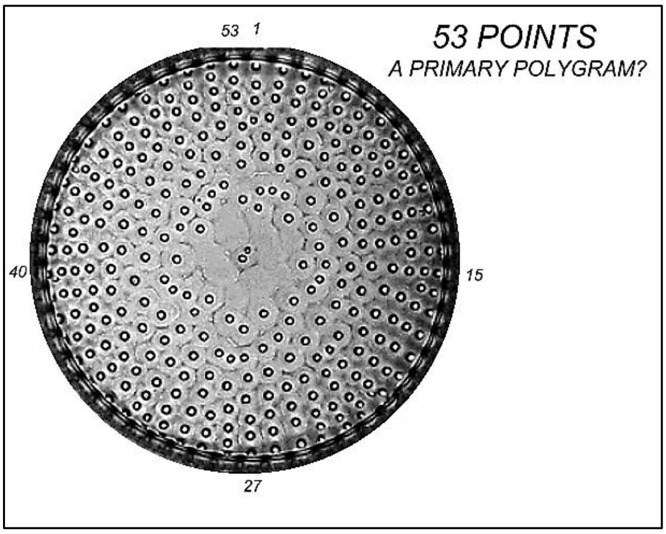
OCTOGRAM X OCTOGRAM and the 53 POINT DIATOM



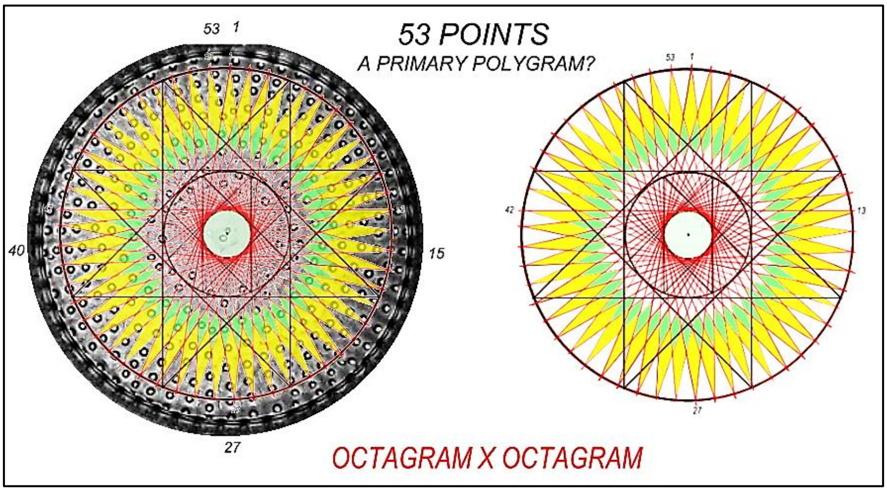
X



Octogram x Octogram = 6.828427125 = 53 point polygram at 17^0 (by Graphics)
(16.98113208^0 - by calculation).
A PRIME NUMBERED SHAPE.

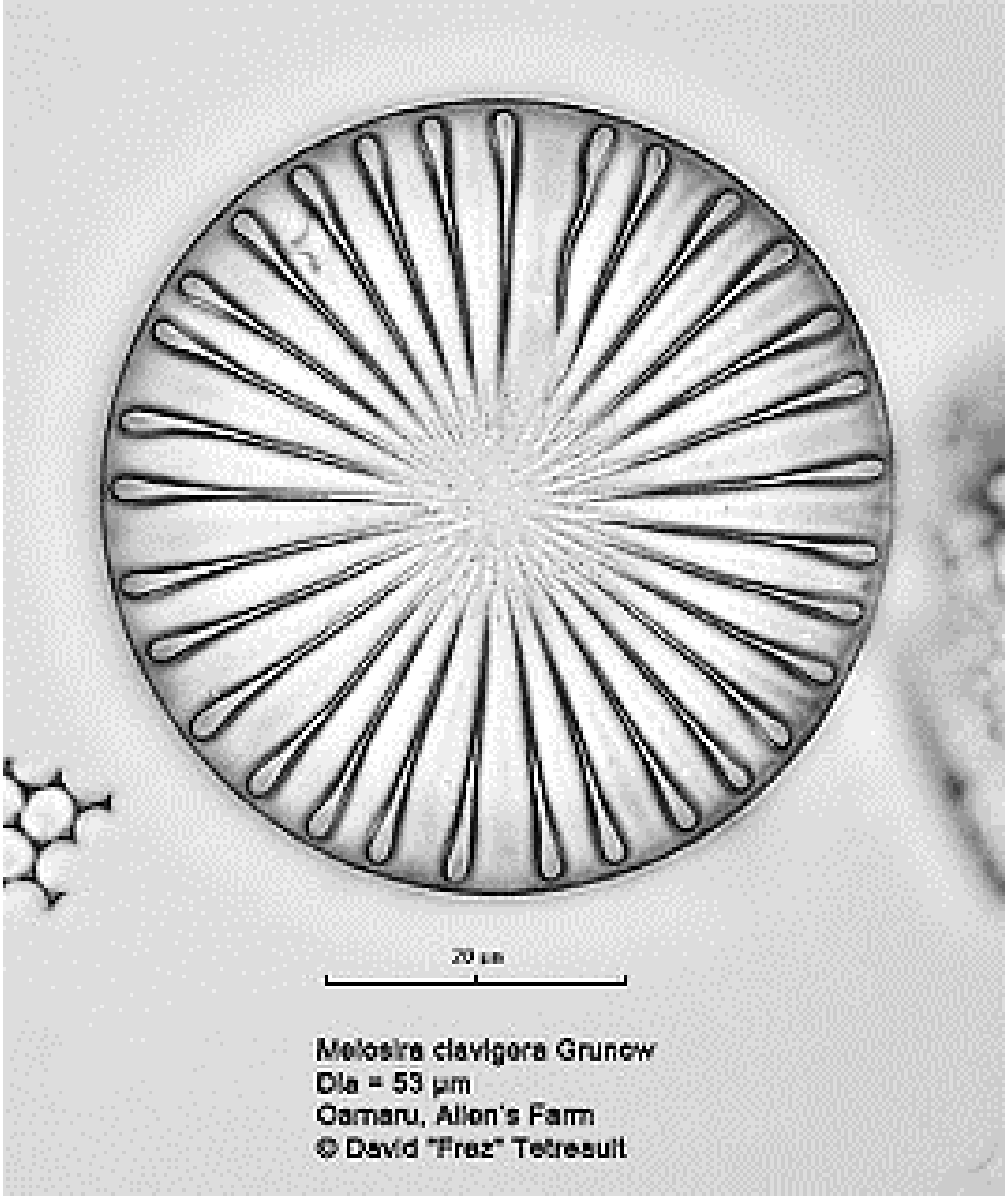


53 POINTS PRIME



MELOSIRA

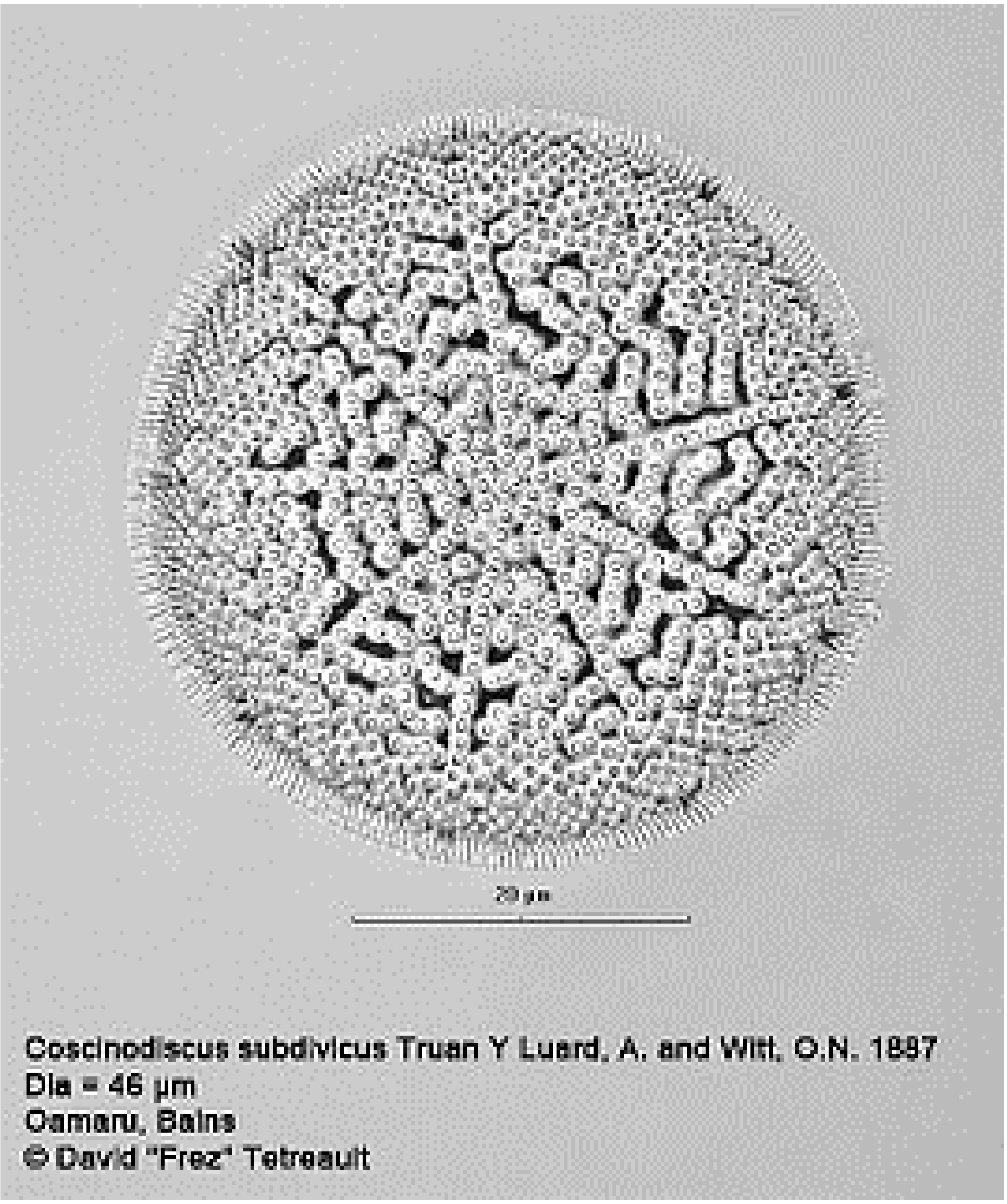
MELOSIRA CLAVIGERA GRUNOW



31 points - PRIME

COSCINODISCUS

COSCINODISCUS SUBDIVICUS



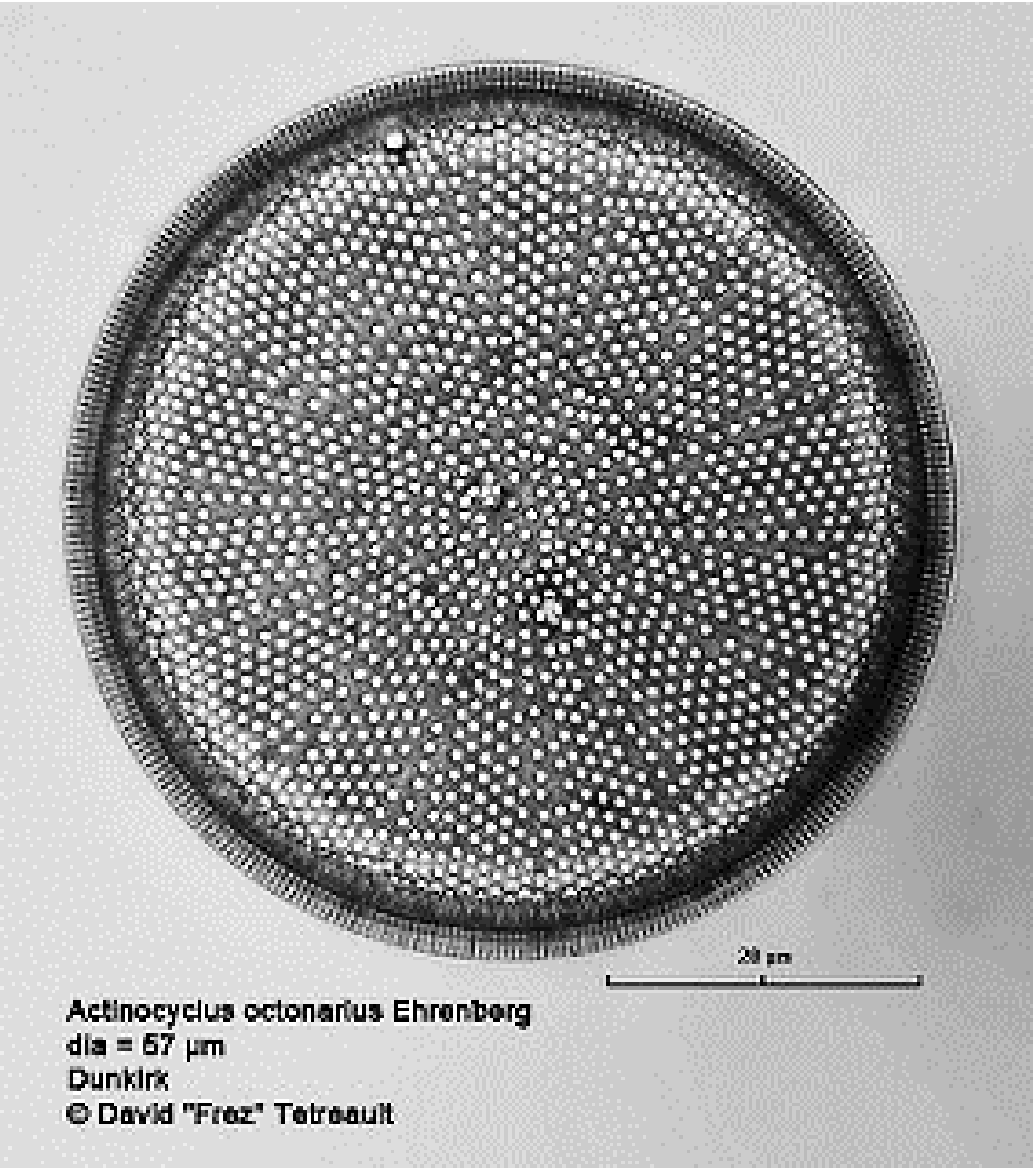
9 points

Truan Y, Luard, A., and Witt, O.N. 1887
OAMARU, BAINS

PRIMES IN PHASE & PARTICLE ENTANGLEMENT?
(PHYSICAL EXAMPLES OF ENTANGLEMENT?)

ACTINOCYCLUS

ACTINOCYCLUS OCTONARIUS EHRENBERG

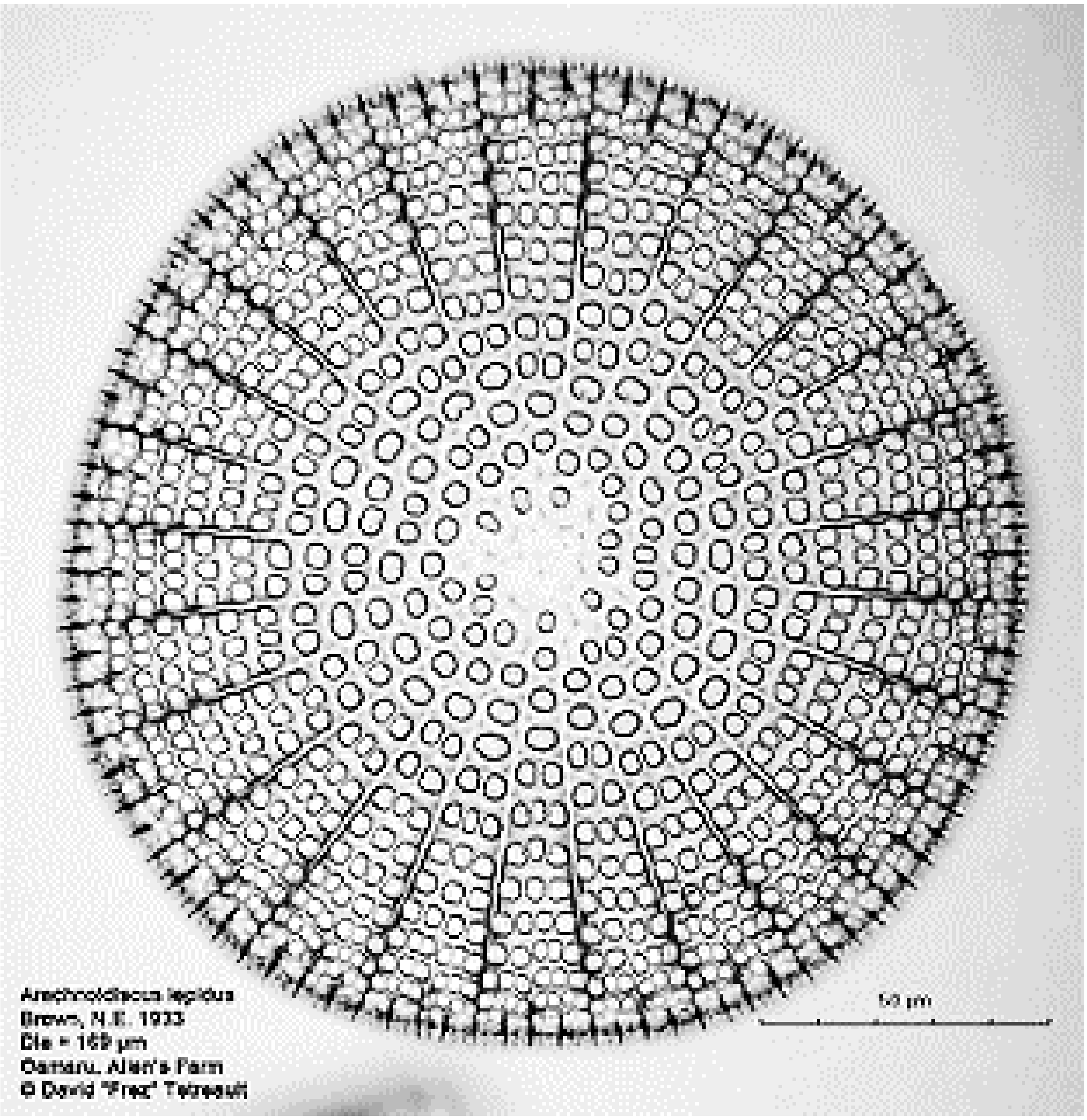


7 points PRIME

OR 2 x 7 in phase - PRIME = 14 points

ARACHNODISCUS

ARACHNODISCUS LEPIDUS

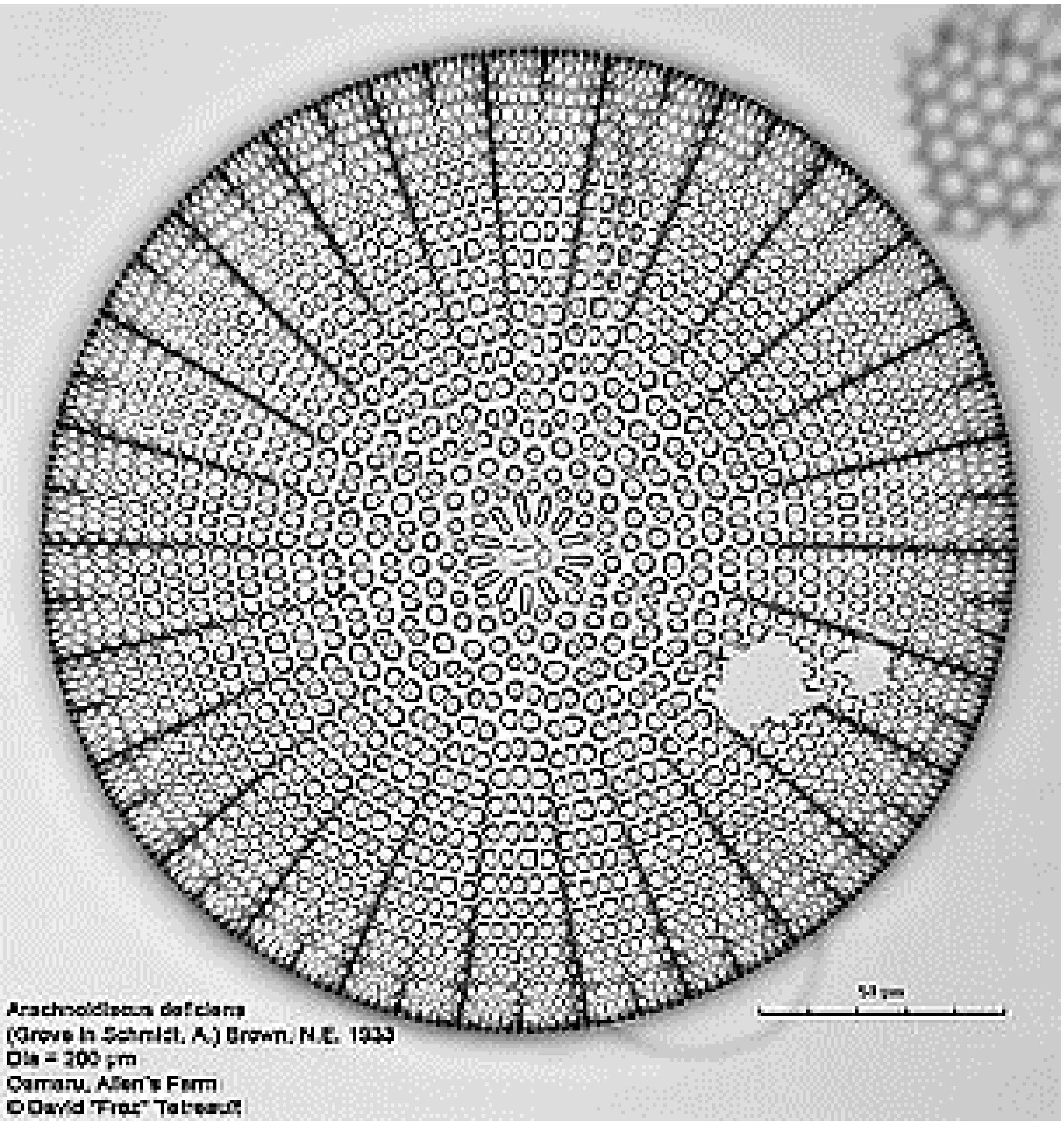


3 / 9 / 27 / points

ARACHNODISCUS LEPIDUS

BROWN – N.E. 1933

ARACHNODISCUS DEFICIENS

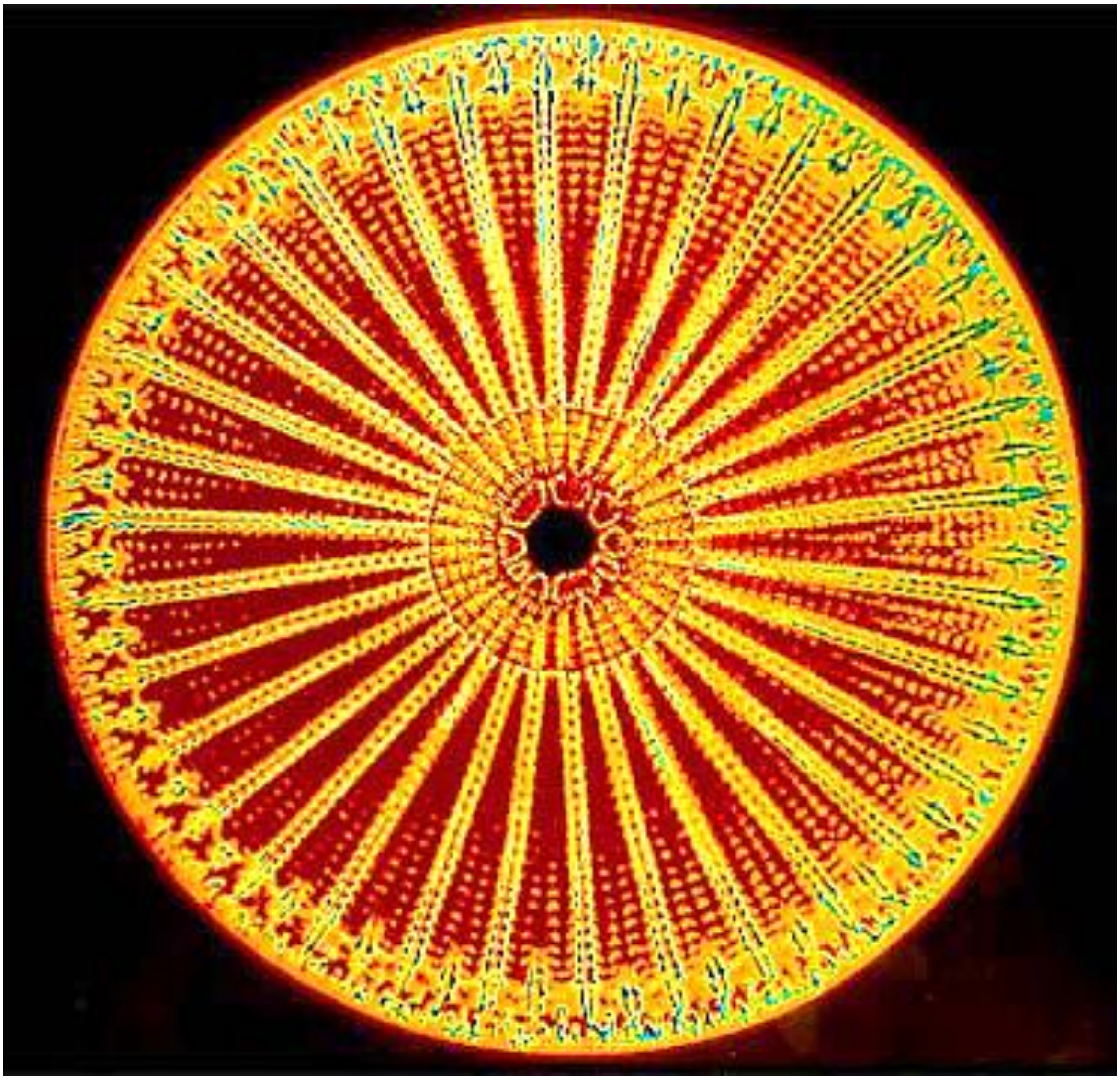


13 / 26 / 52 points

ARACHNODISCUS DEFICIENS
GROVE IN SCHMIDT
BROWN, N.E. 1933

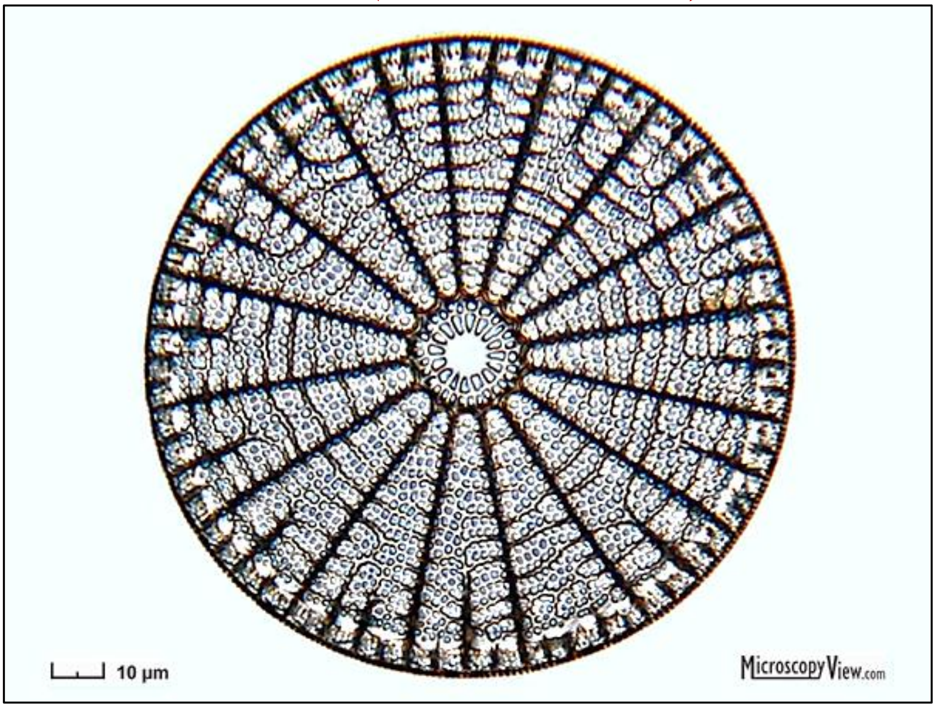
Erachnodiscus (Bacillariophyceae)

ARACHNODISCUS EHRENBERG

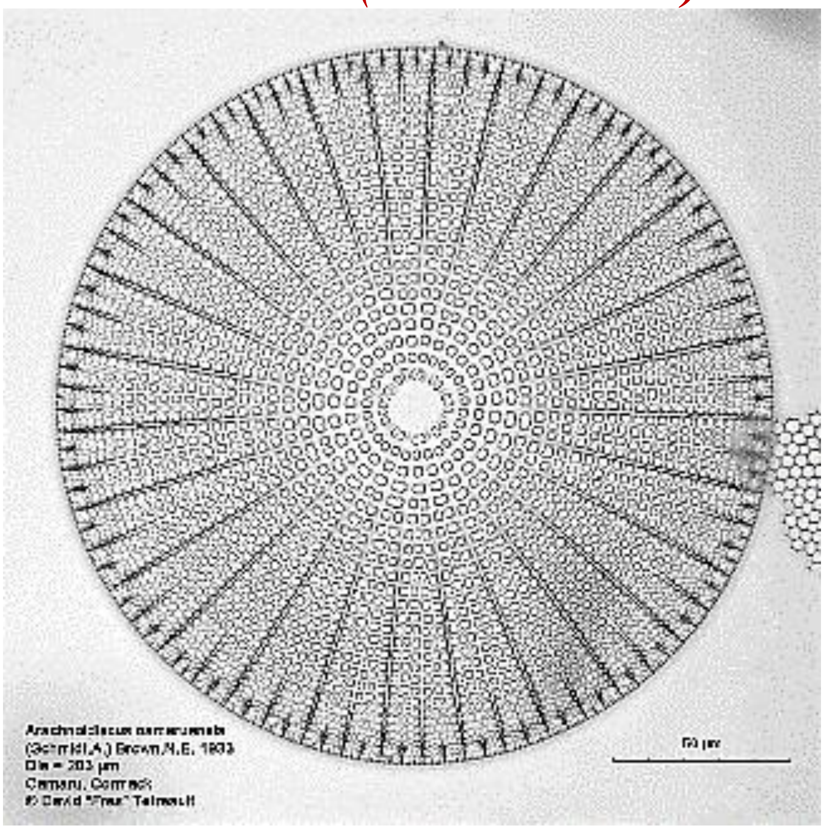


Erachnodiscus ehrenbergii
Image by © Rudolf Rothermel posted online
11 points PRIME or 3 x 11 points in phase = 33 POINTS

Arachnodiscus (Arachnoidiscus) ornatus

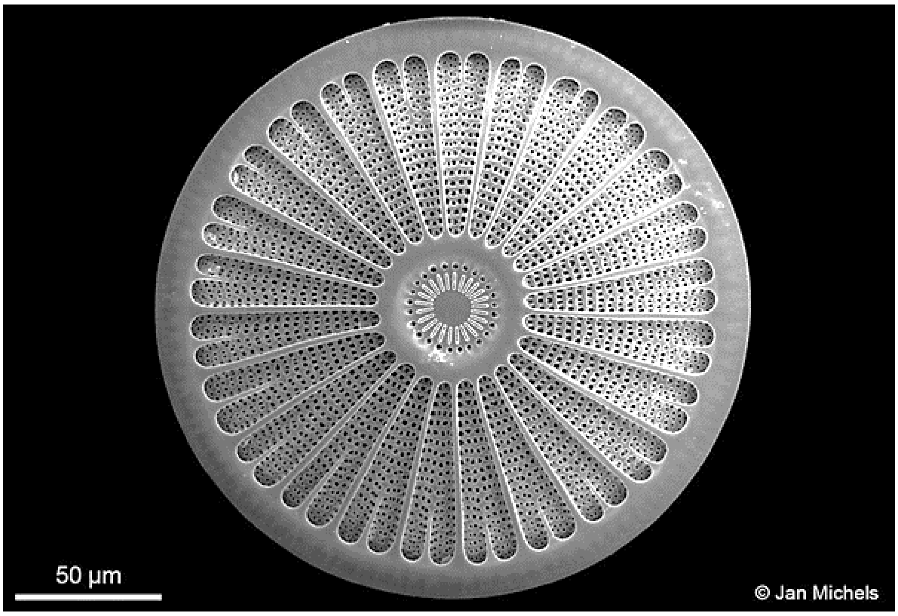


Arachnodiscus (Arachnoidiscus) . . .



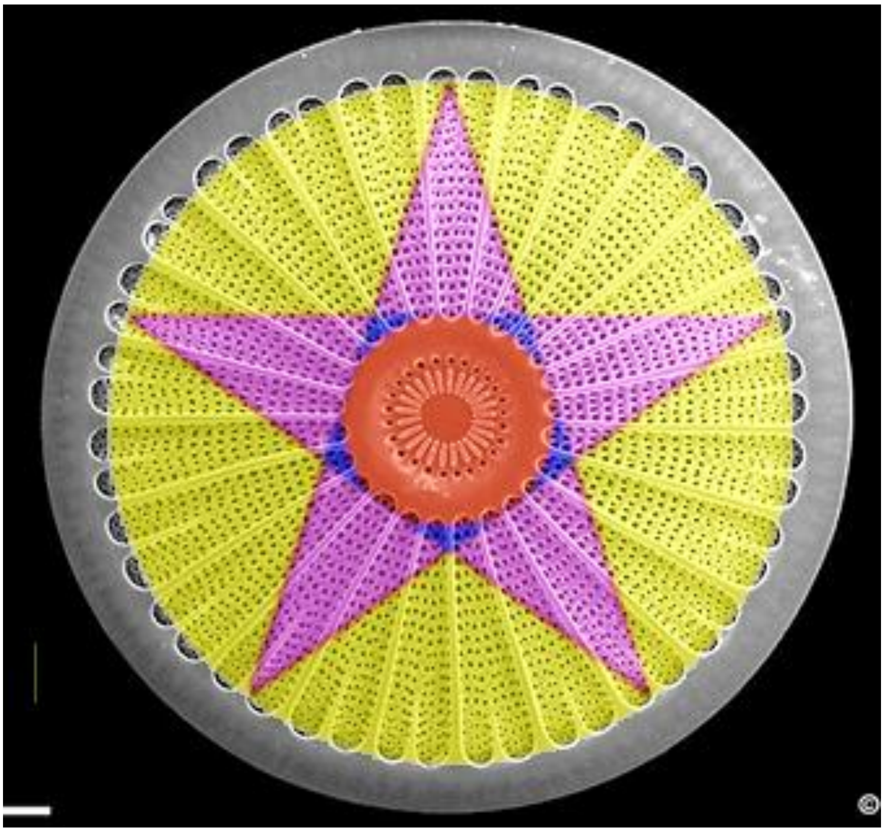
7 / 14 / 28 / 56 / 112 points

ERACHNODISCUS SP.

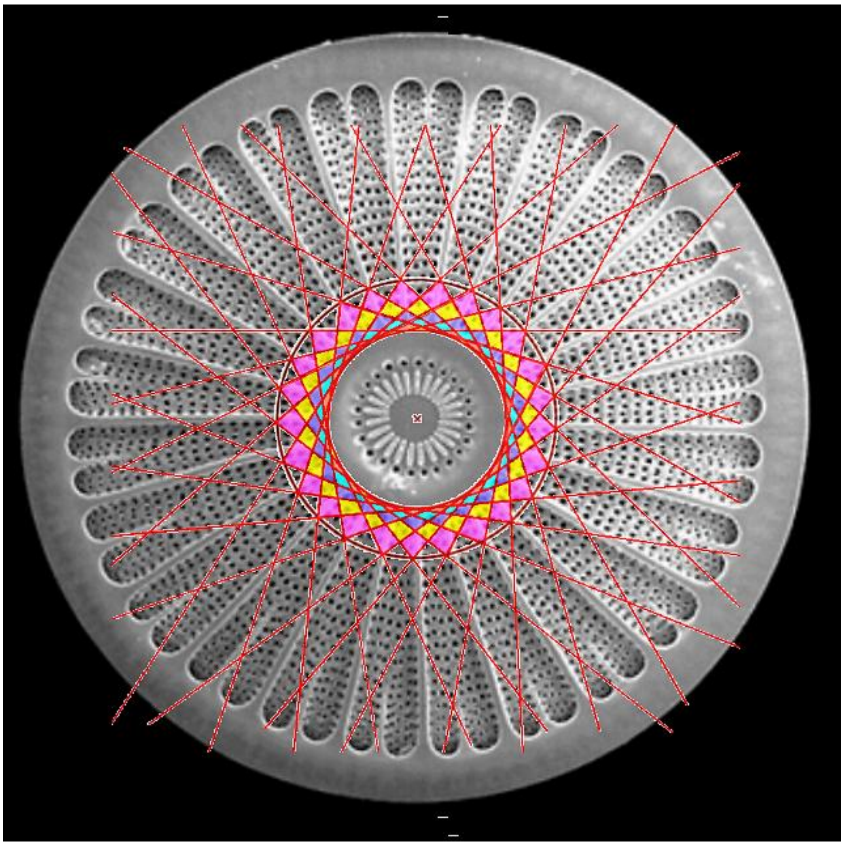


Erachnodiscus sp.
Photograph by © Jan Michels posted online
25 POINTS or 5 times 5 points.

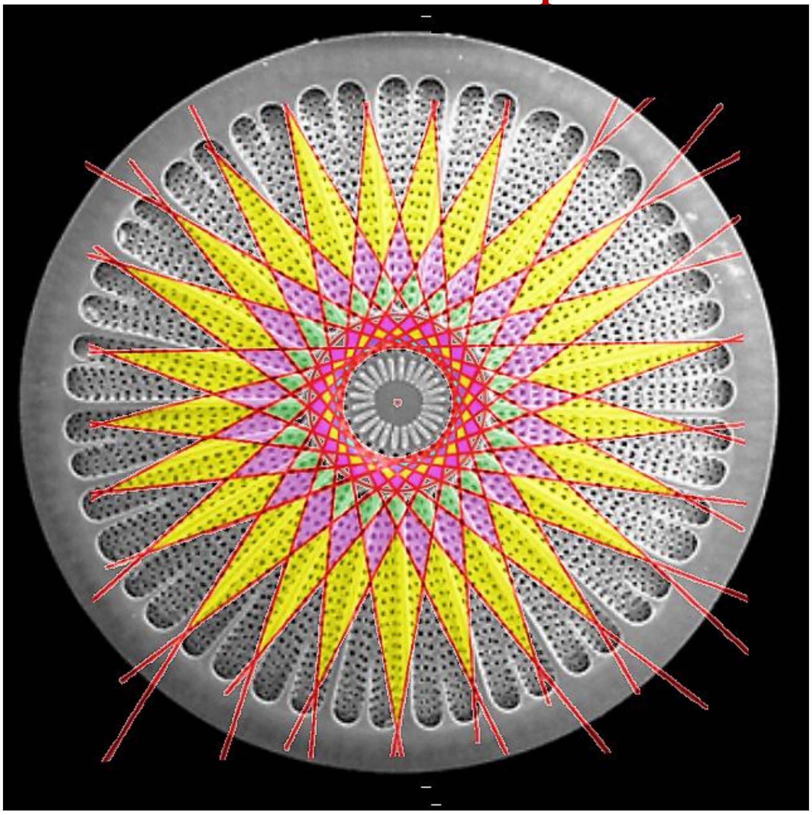
WITH A PRIMARY PENTAGRAM



5 x 5 points = 25 points

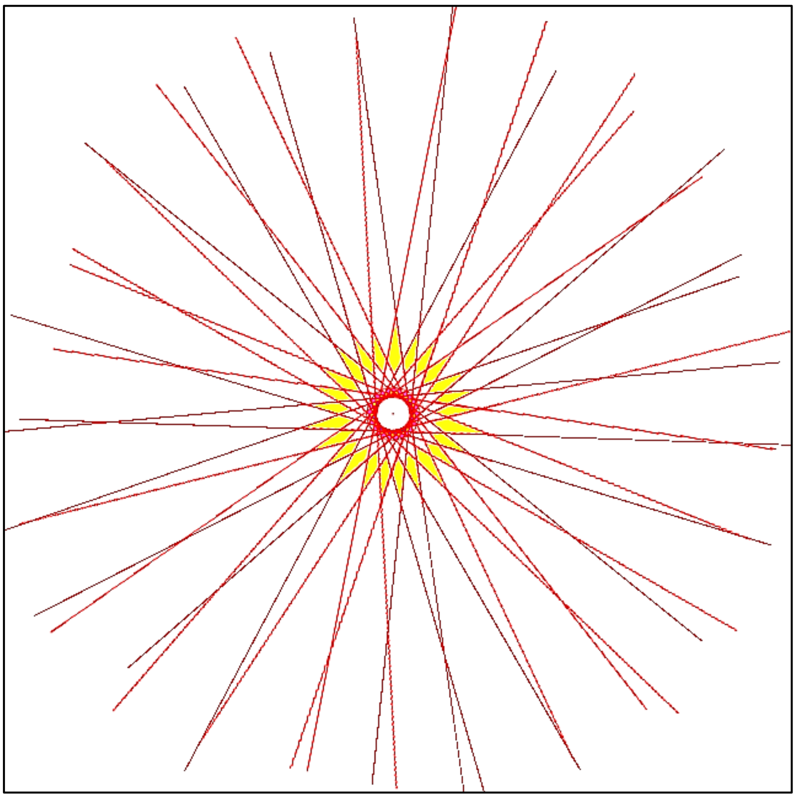


***Erachnodiscus* sp**

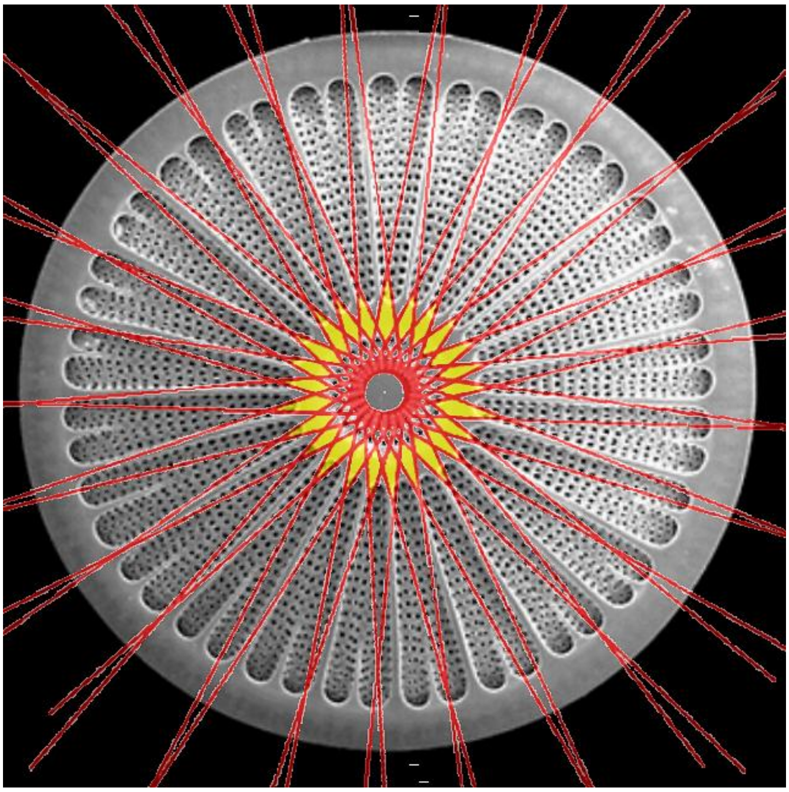


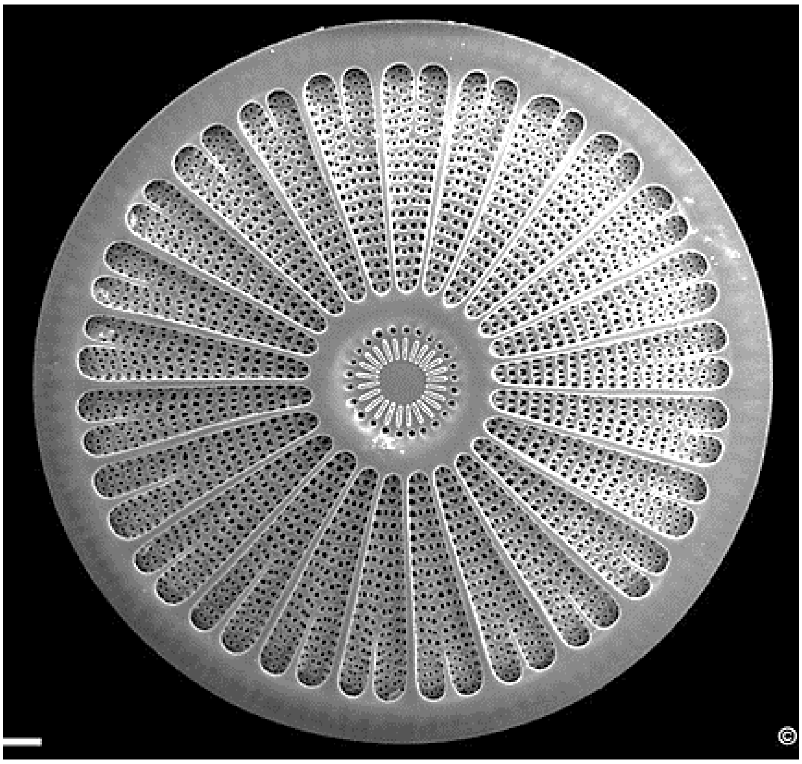
25 points

MY 25 POINT POLYGRAM EXTENDED TO ITS OUTER LIMIT

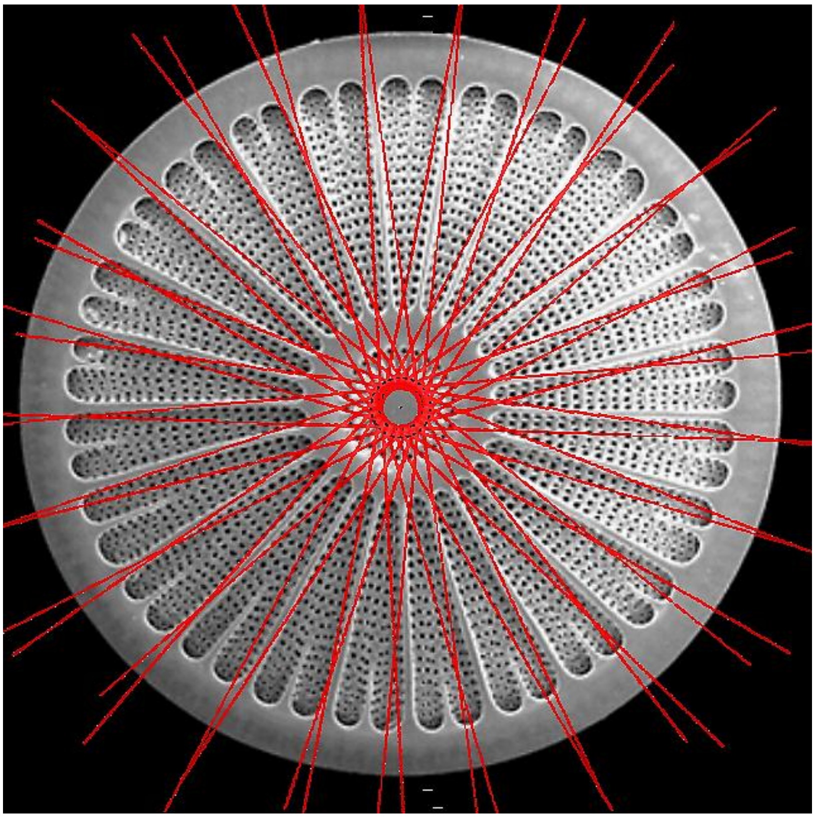


DIATOM WITH A PRIMARY 25 POINT POLYGRAM





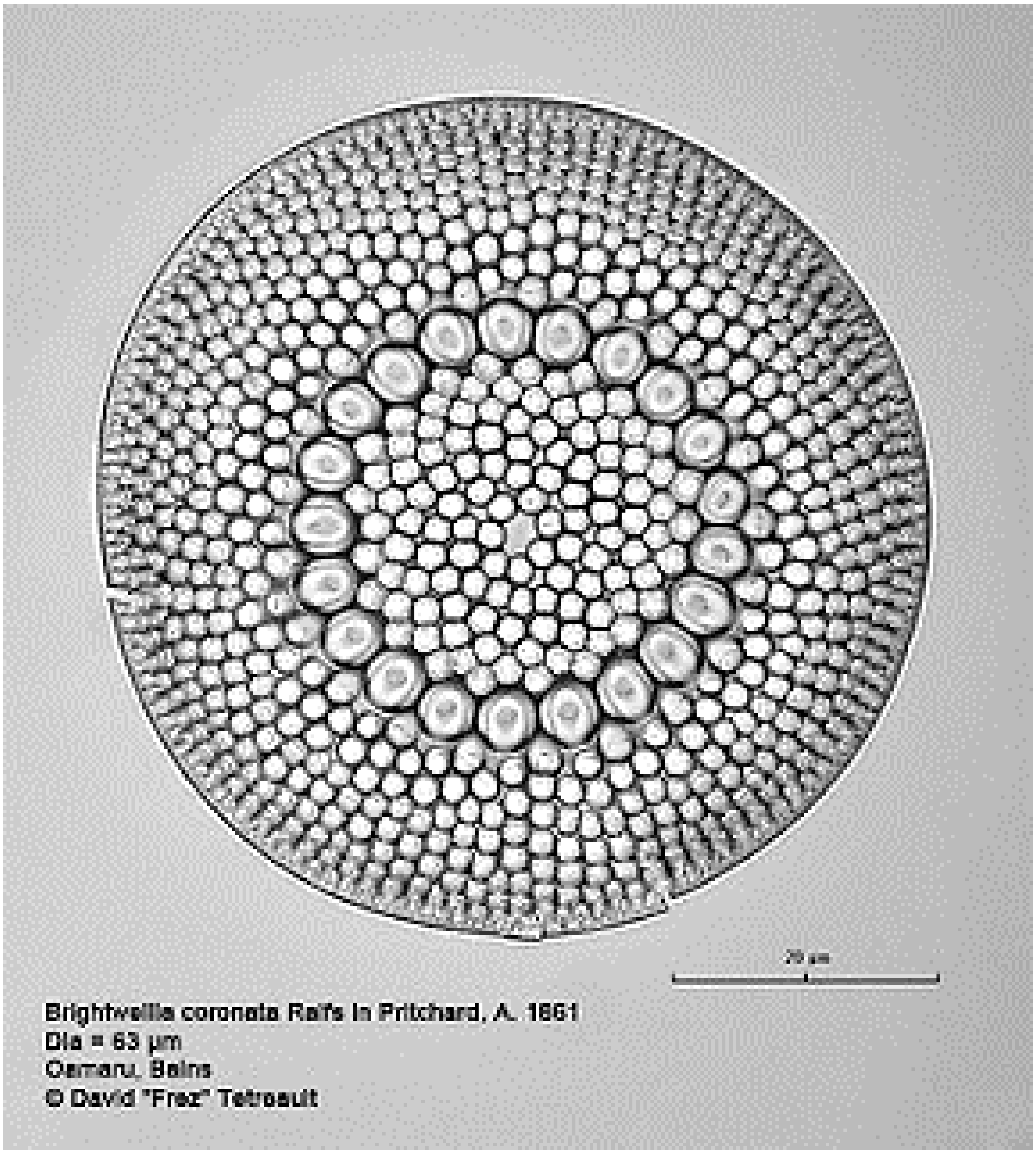
DIATOM WITH A PRIMARY 25 POINT POLYGRAM



25 points

BRIGHTWELLIA

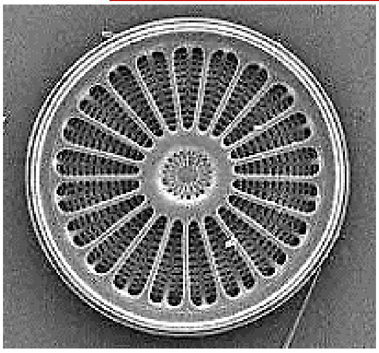
BRIGHTWELLIA CORONATA



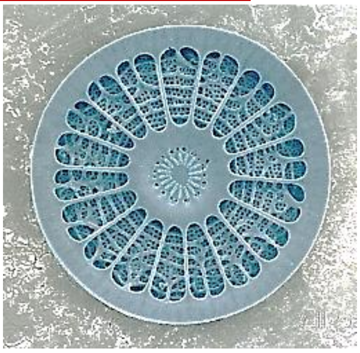
7 / 21 points

BRIGHTWELLIA CORONATA
RALFS IN PRITCHARD A 1861

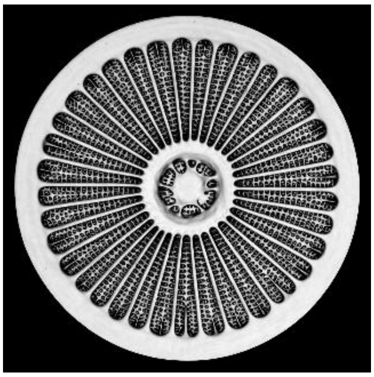
COSCINODISCUS



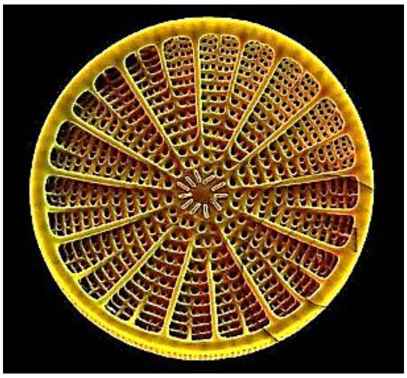
7 / 21 / 42 points



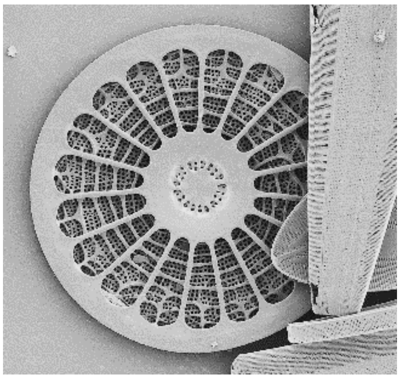
9 / 18 / 36 points



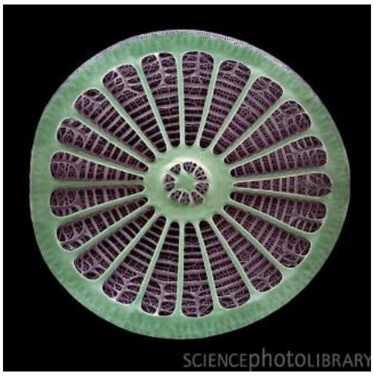
9 / 18 / 36 / 72 points



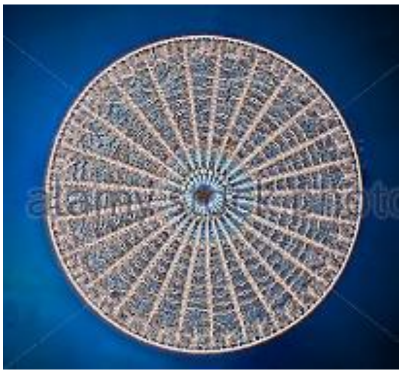
12/ 24 points



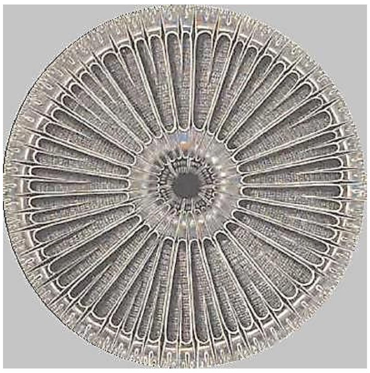
19 / 38 points



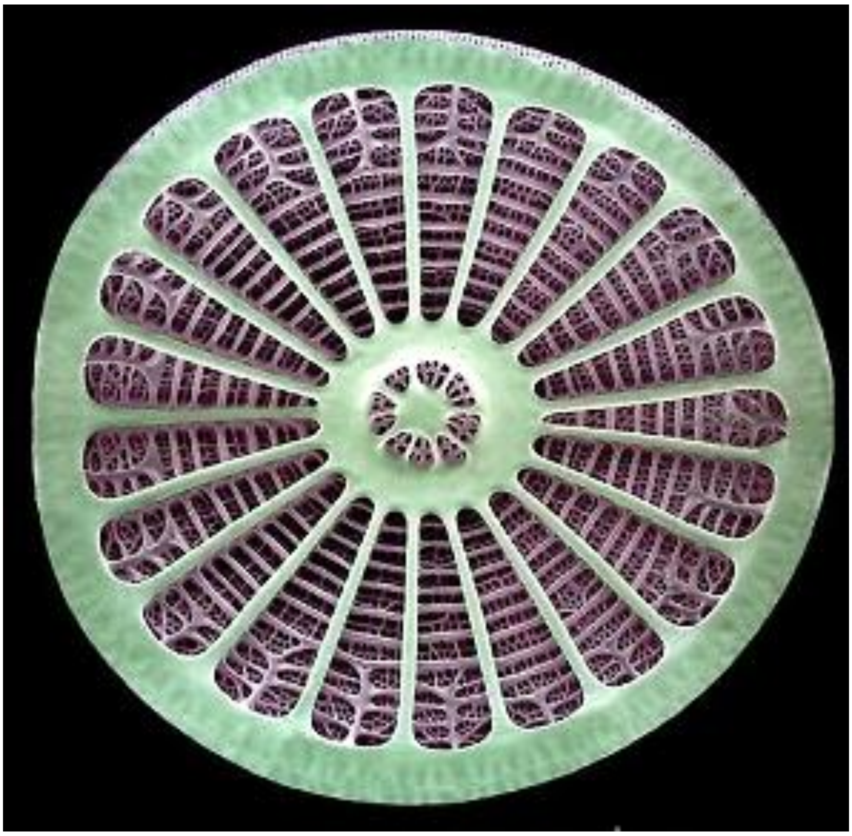
21 points



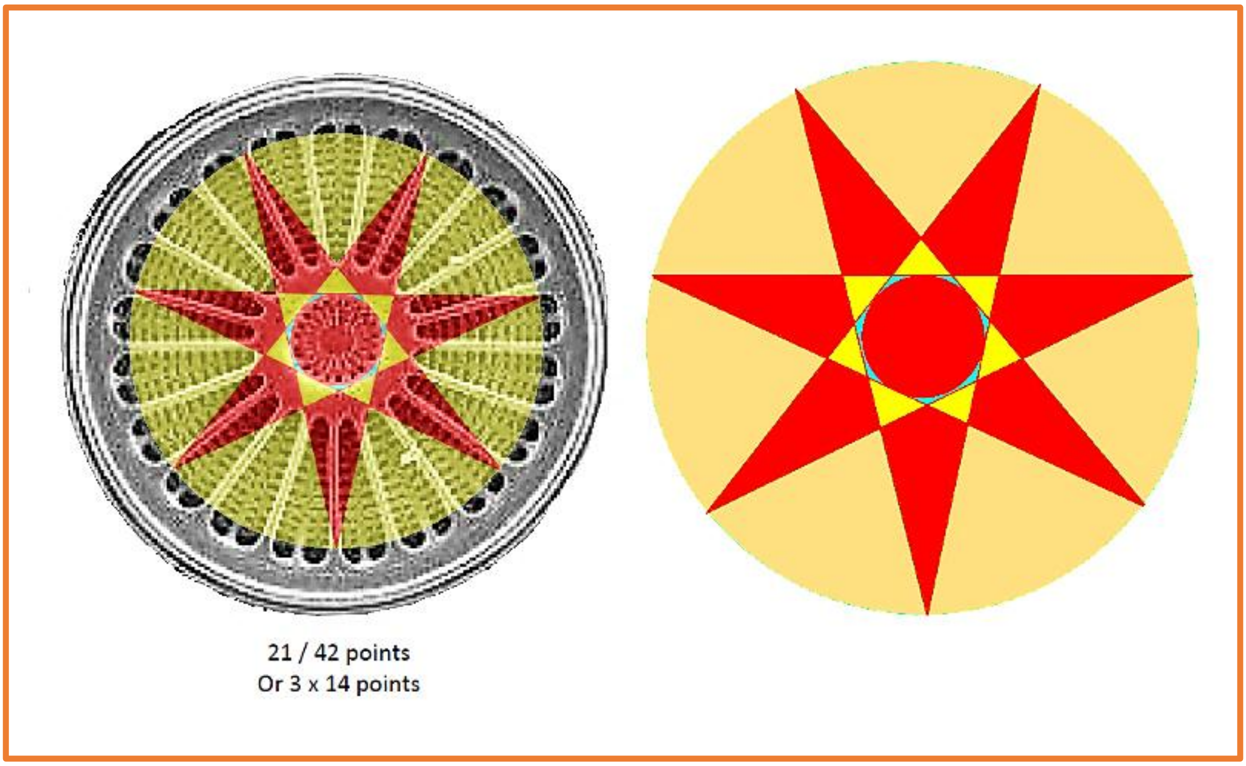
26 points



29 points

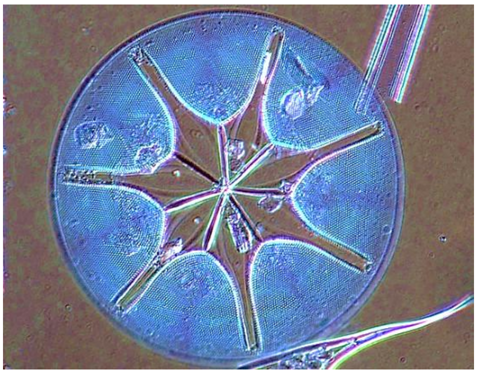


Arachnoidiscus japonicus?????



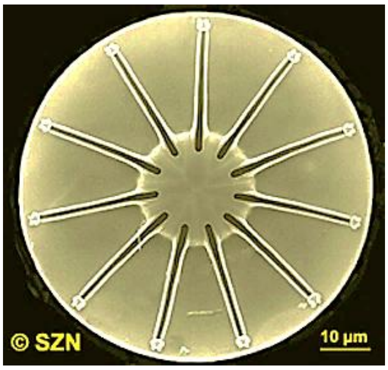
Asterolampra IMAGES

ALL PRIME NUMBERS?

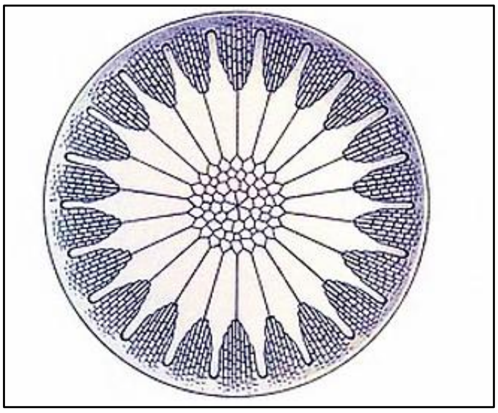


7 POINTS – PRIME

7 POINTS – PRIME



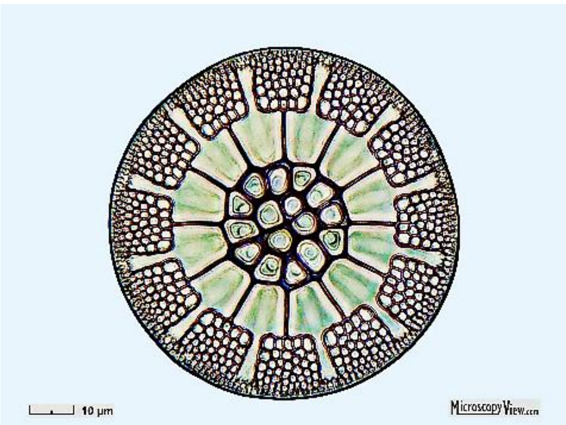
11 POINTS - PRIME



11 / 22 POINTS – PRIME

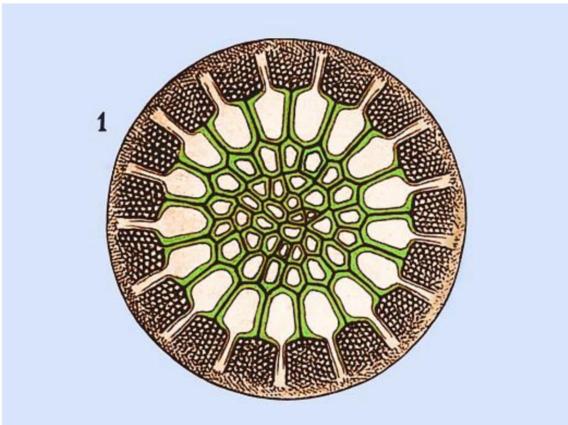
ASTEROLAMPRA EXIMIA

Sketch by ***Ernst Haeckel***, *Kunstformen der Natur*,



3 / 6 / 12 POINTS – PRIME

ASTEROLAMPRA DECORA



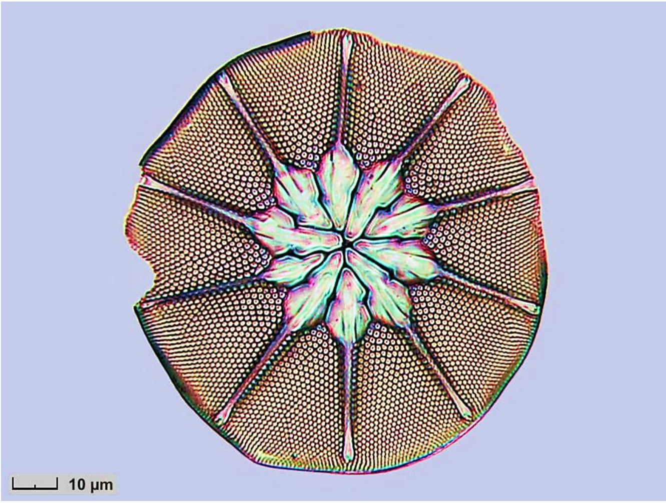
17 points PRIME

ASTEROLAMPRA INSIGNIS

ASTEROLAMPRA MARYLANDICA

7 POINTS - PRIME

ASTEROLAMPRA MORONENSIS



5 / 10 POINTS - PRIME

Putting all of this simply:

- Plane Regular Shapes may be seen to be *"The Dough in the Doughnut"* that exists between a Circumscribing Circle and an Inscribing Circle. The shape is identified by the Ratio of the relative sizes of these two circles.
- Circular features of the Universe may be measured in terms of Plane Regular Shape Ratios.
- Plane Regular Shape Ratios can be arrayed in a manner that indicates complete relative harmony with Music Frequencies and so validates Plato's arguments in *"Glaucon"* for *the two harmonies of sight and sound*.

- Circular Diatoms such as Arachnoidiscus, Coscinodiscus, Asterolampha, Melosira, often display the relevant two circles that define the particular Plane Regular Shape associated with a particular Diatom.
- The Diatom itself will display more features of the relevant Plane Regular Shape such as radials which will direct the enquirer to the possible number of apexes in the relevant Plane Regular Shape. This step requires one to ascertain whether the radials indicate the number of apexes for the shape or whether the Diatom displays a Shape that may exist as a Prime Number *"In Phase with itself"* two or more times. *Only the Ratio of the two relevant circles* can verify the correct result. This feature may possibly go well towards assisting **Du Sautoys**' search for Primes in Nature.

- If Sound Frequencies can produce Plane Regular Shapes and if Diatoms can display these Shapes on their Frustules, should we use Sound Waves to mechanically test and verify the physical qualities of a particular Diatom without first identifying the relevant Sound Frequency that may be relevant to the shape of the Diatom or to the shape it displays on its frustule?
- Should we use sound and sonar to locate Diatoms?

- What range of frequencies is used in Sonar searching?

- If Diatoms can be arrayed by their *"Plane Regular Shapes"* in my Shape to Music Genome then we should be able to apply a certain type of mathematics to them. The Genome lists ***Degrees – Shape – Ratio*** as relevant identifiers. If the Diatom displays the components of Plane Regular Shape then all theorems and equations identified in Plane Regular Shape Theory should also become applicable to Diatom Analysis.
    - Physical Size is irrelevant to Plane Regular Shape.
    - How about *Shape x Shape = Shape*? *Both Graphically and Mathematically?*
    - Were the Plane Regular Shapes on Diatom frustules formed cymatically by sound waves?

- Can it be inferred that if Plane Regular Shapes are found to be displayed upon Diatom Frustules then all attributes and mathematics of Plane Regular Shapes may somehow be applied to Diatoms?

- ***PRIMES IN PHASE & PARTICLE ENTANGLEMENT?***
- ***(PHYSICAL EXAMPLES OF ENTANGLEMENT?)***

Journal of Phycology

RESEARCH ARTICLE

Microscopic image recognition of diatoms based on deep learning

Siyue Pu, Fan Zhang, Yuexuan Shu, Weiqi Fu

First published: 23 November 2023

https://doi.org/10.1111/jpy.13390

Editor: T. Mock

Siyue Pu and Fan Zhang contributed equally to this study.

Abstract

'Diatoms are a crucial component in the study of aquatic ecosystems and ancient environmental records. However, traditional methods for identifying diatoms, such as morphological taxonomy and molecular detection, are costly, are time consuming, and have limitations.

To address these issues, we developed an extensive collection of diatom images, consisting of **7983 images** from 160 genera and 1042 species, which we expanded to **49,843** through preprocessing, segmentation, and data augmentation.

Our study compared the performance of different algorithms, including backbones, batch sizes, dynamic data augmentation, and static data augmentation on experimental results.

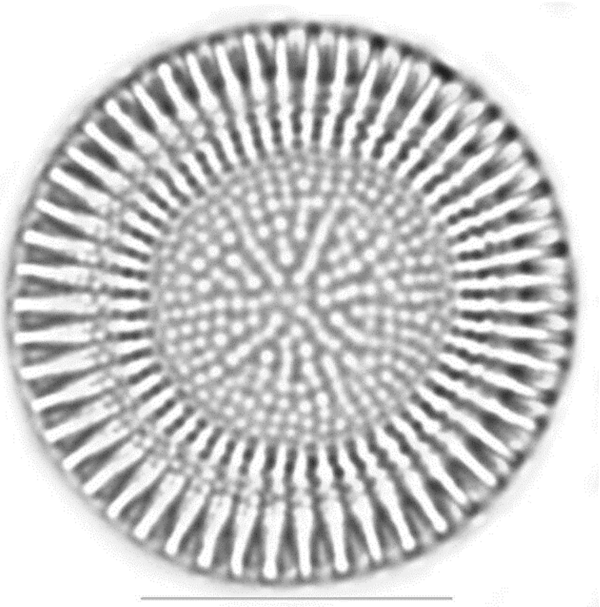
We determined that the **ResNet152 network** outperformed other networks, producing the most accurate results with top-1 and top-5 accuracies of **85.97%** and **95.26%,** respectively, in identifying 1042 diatom species. Additionally, we propose a method that combines model prediction and cosine similarity to enhance the model's performance in low-probability predictions, achieving an 86.07% accuracy rate in diatom identification.

Our research contributes significantly to the recognition and classification of diatom images and has potential applications in water quality assessment, ecological monitoring, and detecting changes in aquatic biodiversity.'

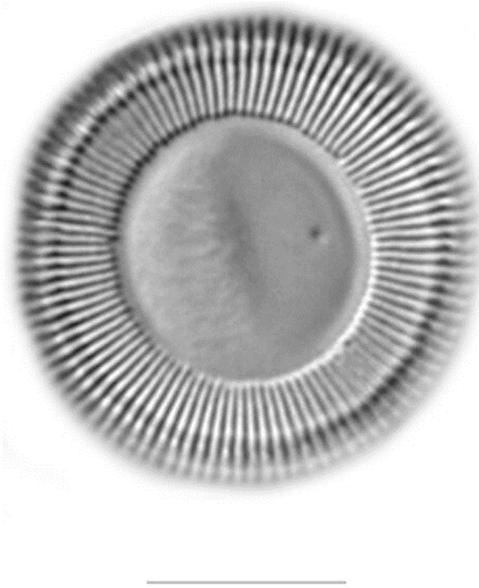
CITATION

Stoermer, E.F. and Julius, M.L. (2003) Centric Diatoms *In: Freshwater Algae of North America (J.D. Wehr and R.G. Sheath, eds) Elsevier Science pp. 559-594*

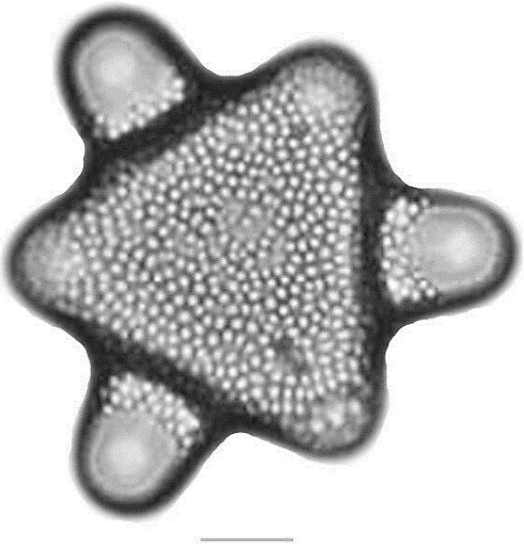
GENERA



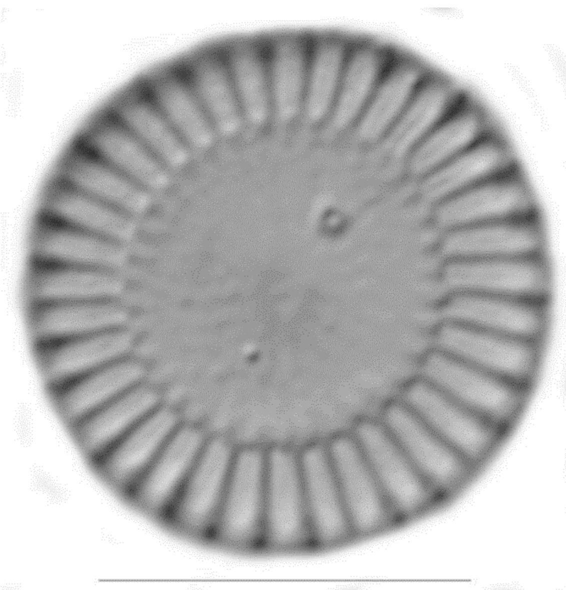
Cyclostephanos



Cyclotella

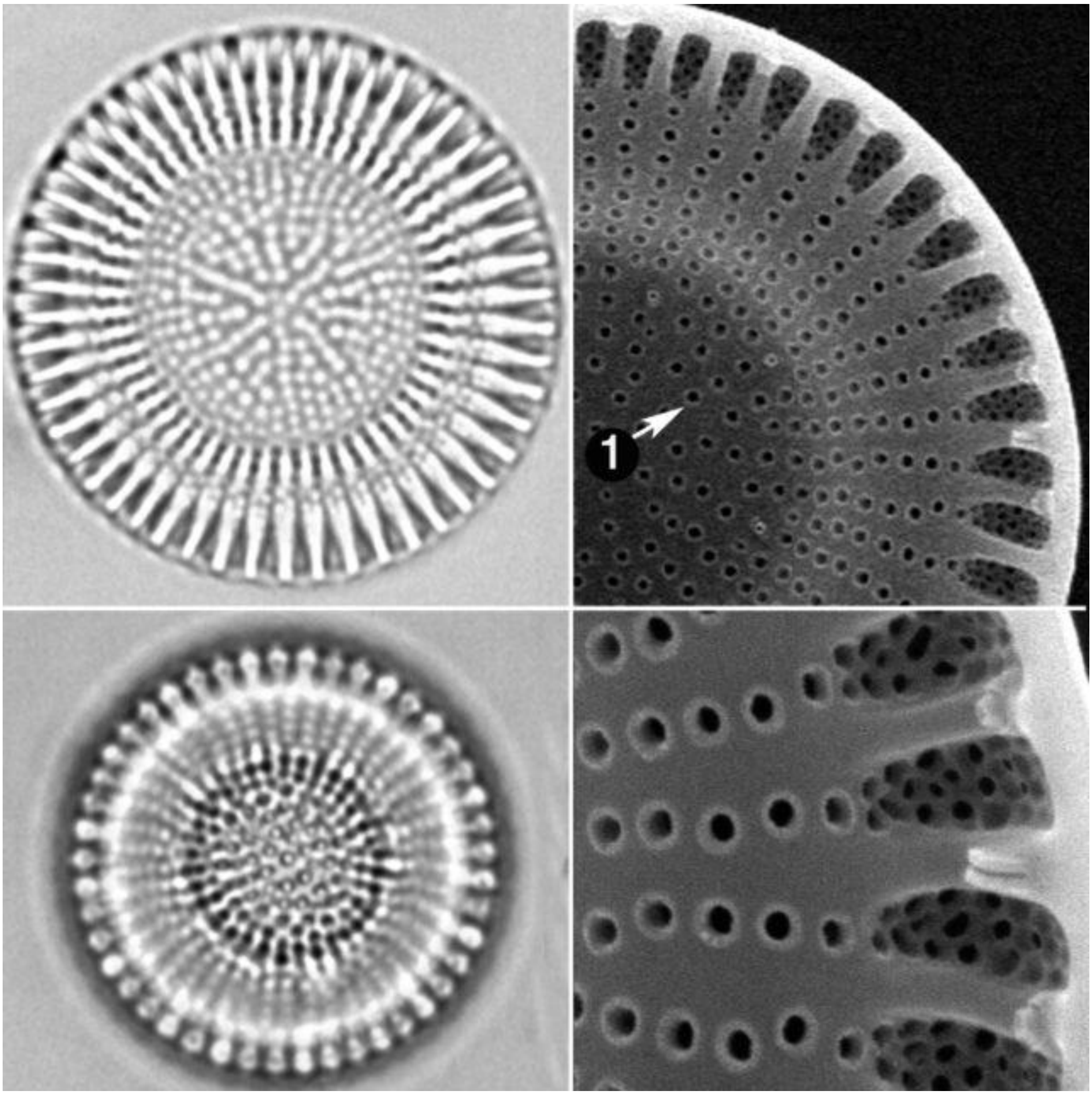


Hydrosera



Stephanocyclus

HOW PHYTOCOLOGISTS DEAL WITH PLANE REGULAR SHAPE:

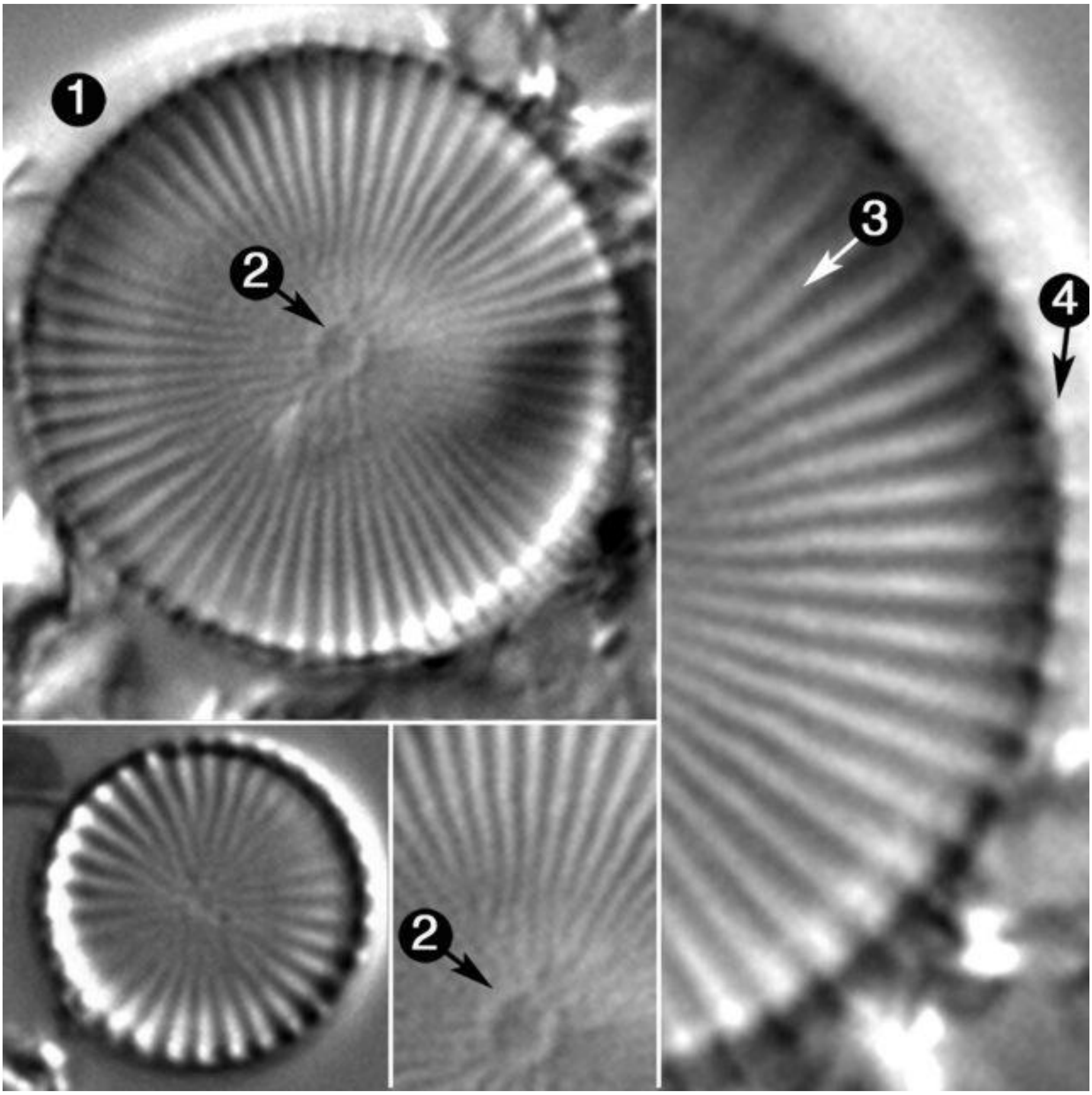


CENTRIC

Cyclostephanos

1. **Striae fasciculate, extending from valve face to mantle**
2. Costae may form 2 branches on mantle
3. Rimoportulae positioned near, and below spine on mantle

   The striae of Cyclostephanos are organized into bundles, or fascicles, that extend from the valve face onto the mantle. The costae, or thickened ribs, also extend from the valve face to mantle. The costae branch on the valve mantle below the plane of the marginal spines, a key feature of the genus. Marginal rimoportulae are positioned...



Cyclostephanos invisitatus

(M.H.Hohn and Hellermann) E.C.Ther., Stoermer and Håk. 1998

1. Valve face flat
2. **Striae originate from central annulus**
3. Striae and areolae fine
4. Spines on every interfasicle
   Valves are discoid, with a flat valve face. **Striae are fine and uniseriate in the valve center, becoming multiseriate at the valve margin**. Short, spathulate spines are present.

Cite This Page
Spaulding, S., Edlund, M. (2008). Cyclostephanos. In Diatoms of North America. Retrieved January 22, 2025, from https://diatoms.org/genera/cyclostephanos

Diatoms of North America
The source for diatom identification and ecology

Cite as: Spaulding et al. 2021. Diatoms.org: supporting taxonomists, connecting communities. Diatom Research 36(4): 291-304.
https://doi.org/10.1080/0269249X.2021.2006790

- Home
- What are Diatoms?
- About Us
- Contact Us
- Practitioners
- Morphology
- Genera
- Species
- Glossary

Citations & Links

Citations

Edlund, M.B., Engstrom, D.R., Triplett, L.D., Lafrancois, B.M. and Leavitt, P.R. (2009) Twentieth century eutrophication of the St. Croix River (Minnesota-Wisconsin, USA) reconstructed from the sediments of its natural impoundment **Journal of Paleolimnology 41(4): 641-657.**
Publication Link: 10.1007/s10933-008-9296-1

- **Hohn, M.H. and Hellerman, J. (1963)** The taxonomy and structure of diatom populations from three Eastern North American rivers using three sampling methods. **Transactions of the American Microscopical Society 82(3):250-329.**
- **Houk, V., Klee, R. and Tanaka, H. (2014)** Atlas of freshwater centric diatoms with a brief key and descriptions Part IV. Stephanodiscaceae B: **Stephanodicsus, Cyclostephanos, Pliocaenicus, Hemistephanos, Stephanocostis, Mesodictyon & Spicaticribra. In: Poulícková, A. (ed.): Fottea 14 Supplement, 529 pp.**
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  Publication Link: 10.1080/0269249X.1987.9705003

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  Publication Link: http://dx.doi.org/10.1071/MF04032

- **Yang, X., Dong, X., Gao, G., Pan, H., and Wu, J. (2005)** Relationship between surface sediment diatoms and summer water quality in shallow lakes of the middle and lower reaches of the Yangtze River. **Journal of Integrative Plant Biology 47(2): 153–164**

  Publication Link: 10.1111/j.1744-7909.2005.00035.x

Links

- **Index Nominum Algarum**

  Original, Transfer

- **GenBank**

  Cyclostephanos invisitatus NCBI

- **North American Diatom Ecological Database**

  NADED ID: 19002

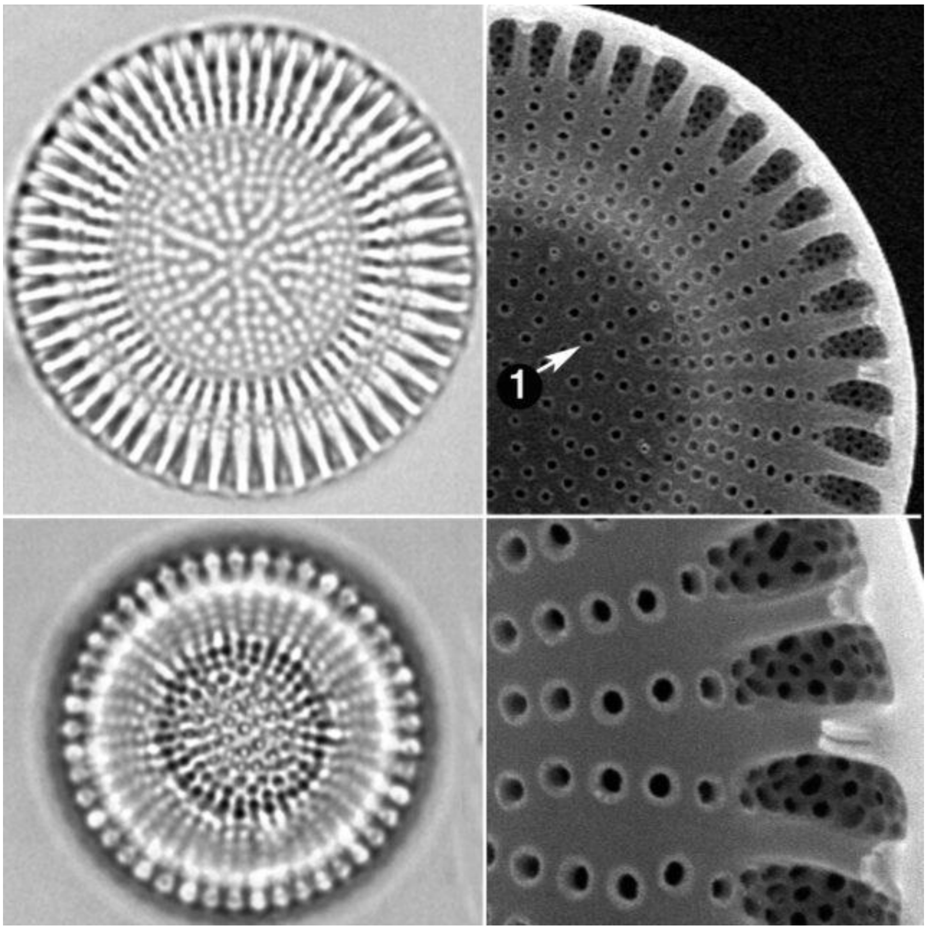
Cite This Page

Burge, D., Edlund, M. (2015). Cyclostephanos invisitatus. In Diatoms of North America. Retrieved January 22, 2025, from https://diatoms.org/species/50787/cyclostephanos_invisitatus

Cyclostephanos

Cyclostephanos novaezeelandiae

Round in Theriot, Håk., Kociolek, Round and Stoermer 1987



- **Category**

  Centric

- **Class**

  Coscinodiscophyceae

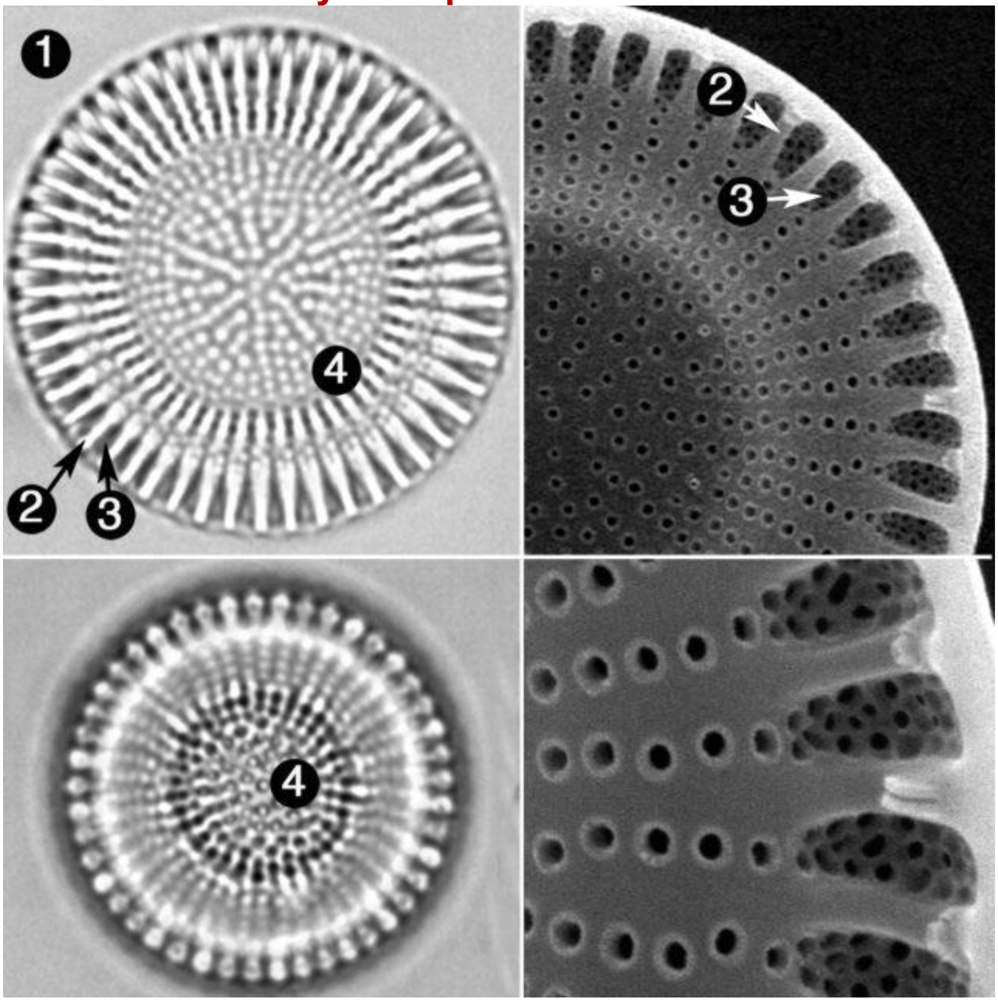
- **Order**

  Thalassiosirales

- **Family,** Stephanodiscaeae
- **Type Species, Cyclostephanos novaezeelandiae** (Cleve in Cleve and Moller) Round in Theriot et al.

- **Contributor,** Sarah Spaulding, Mark Edlund - Dec 2008
- **Reviewer,** Sam Rushforth - May 2010
- **Species, Citations & Links**

Cyclostephanos dubius

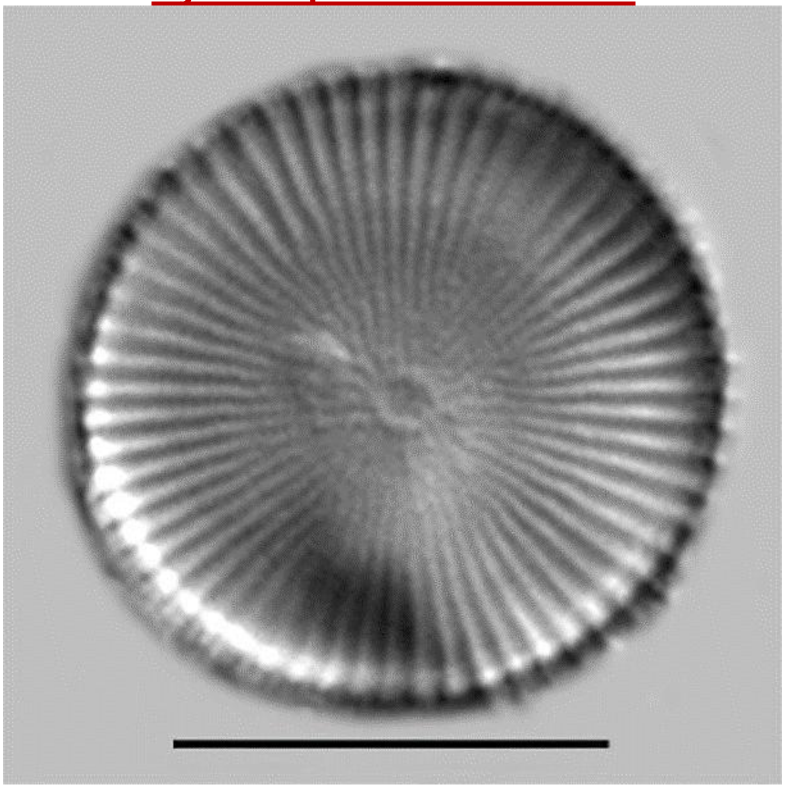


Cyclostephanos dubius

(Fricke) Round in E.C.Ther. et al. 1987

1. Valve concentrically undulate
2. Marginal costae distinct
3. Alveoli distinct
4. **Central areolae organized or scattered**
   Valves are strongly concentrically undulate. Marginal costae alternate with marginal chambers, called alveoli. The central areolae of large specimens are often organized into striae, while the central areolae of smaller specimens are more irregular and scattered. Spines are absent.

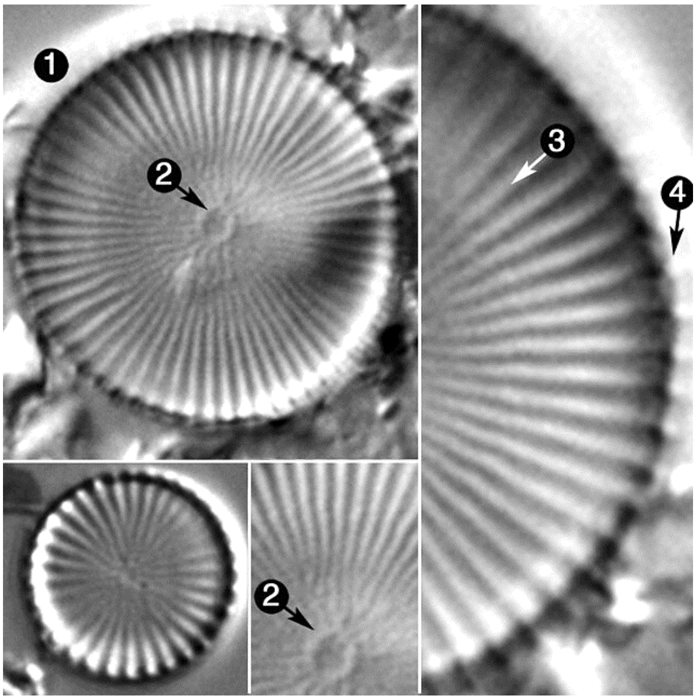
Cyclostephanos invisitatus



Cyclostephanos invisitatus, Diameter: 7-15

Cyclostephanos invisitatus

(M.H.Hohn and Hellermann) E.C.Ther., Stoermer and Håk. 1998



- **Category**

Centric

- **Diameter**

7.8-15.1 µm

- **Striae in 10 µm**

15-16 based on chord count, 12-15 based on circumferential density

- **Contributor**

David R.L. Burge, Mark Edlund - Sep 2015

- **Reviewer**

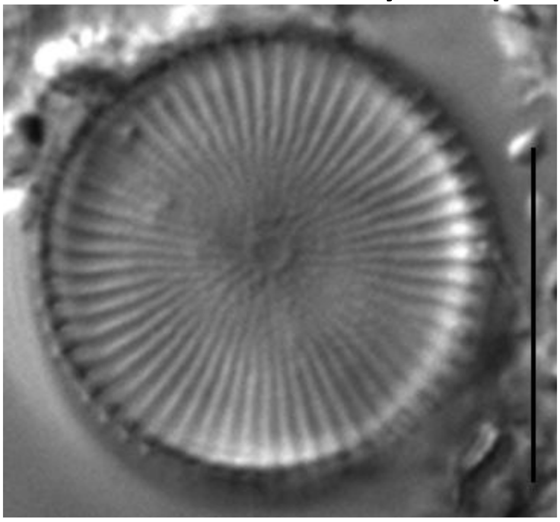
Kalina Manoylov - Feb 2016

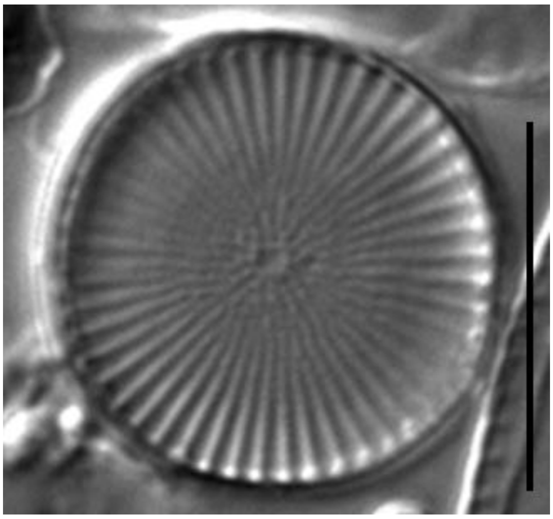
Compare

- **Identification**
- **Autecology**
- **Original Description**
- **Citations & Links**

Identification

Cyclostephanos invisitatus

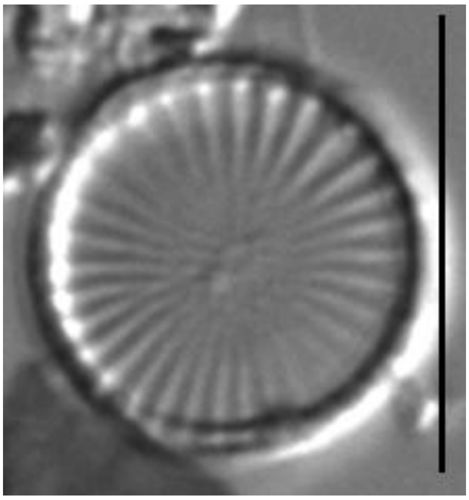


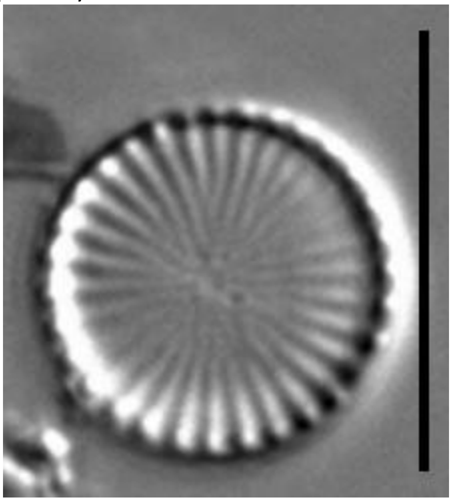


54 POINTS or 2 x 27, or 3 X 18, or 6 x 9, or 18 x 3

49 POINTS 7 x 7 POINTS IN PHASE (PRIME)

DIFFERING NUMBER OF RADIALS (STRIA) AS THEY VARY IN SIZE.

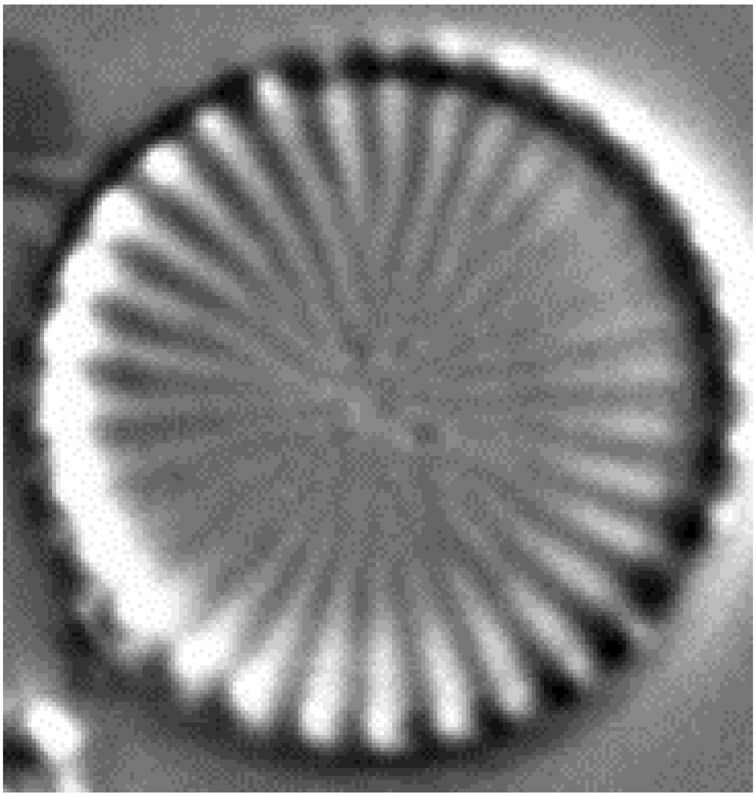




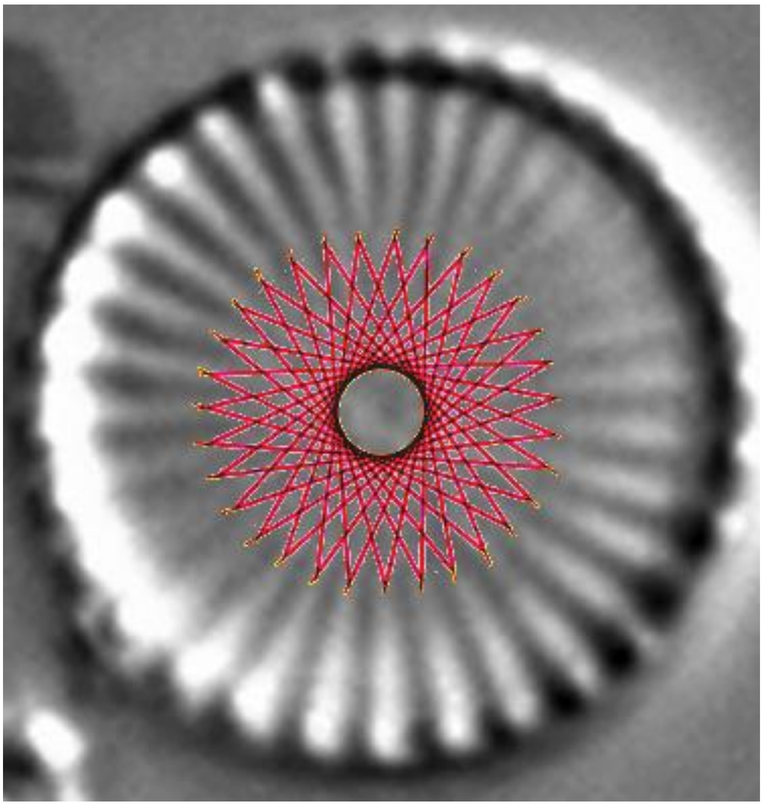
31 POINTS

31 POINTS

EXCEPT FOR THIS PAIR WHICH SHARE THE SAME NUMBER OF POINTS (both Prime).

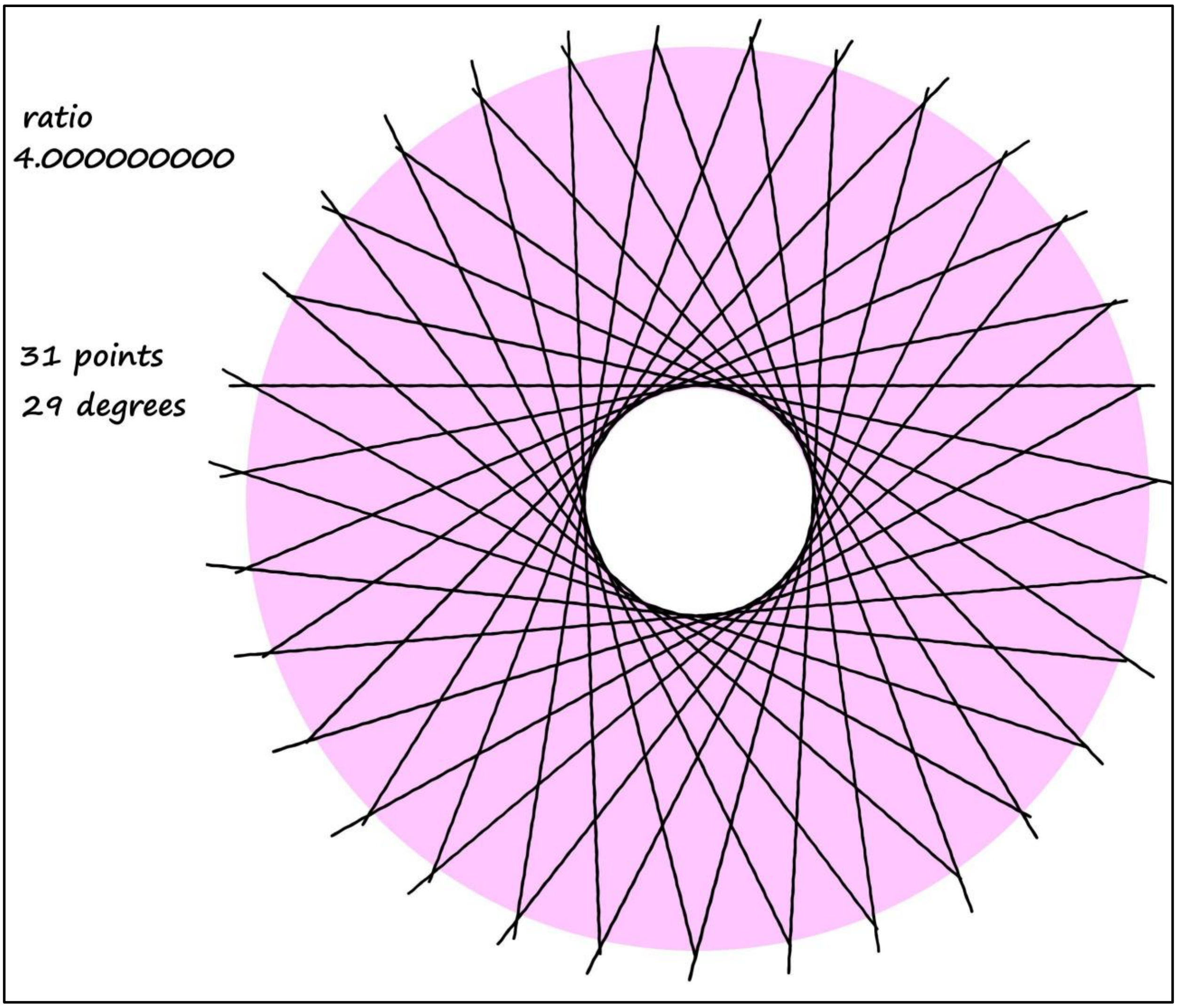


31 points - PRIME



RATIO 4.000000000
= √2 x √2 x √2 x√2

31 POINTS - PRIME



RATIO 4.000000000
= √2 x √2 x √2 x √2

29.032258^{0}

COMPARING DIATOM ANALYSIS WITH PLANE REGULAR SHAPE THEORY:

Description

Valves are discoid, with a flat valve face.
Striae are fine and punctate. Striae are radiate, bundled into fascicles and uniseriate in the center becoming biseriate near the margin.
Fascicles originate from a central annulus and number 15-16 in 10 µm (based on chord count), 12-15 based on circumferential density. Fascicles are branching in some specimens.
Areolae are fine, occurring 16-17 in 10 µm, and are visible only in larger specimens.
Short, spatulate spines are present near the margin on every interfasicle.
Usually one central **fultoportula** is present, but occasionally two fultoportulae are present.
The location of the fultoportulae is variable, according to Houk et al. (2014) and may be located anywhere from near the central annulus to near the valve margin.

Autecology

Cyclostephanos invisitatus is planktonic and regarded as an indicator of eutrophic conditions in rivers (Edlund et al. 2009) and shallow lakes (Yang et al. 2005). Observed in all of the Laurentian Great Lakes, Reavie and Kireta (2015) found **C. invisitatus** to have a high total phosphorus optimum and most common in Lake Erie. Tibby and Reed (2004) found **C. invisitatus** to be more abundant in Iow salinity waters. In addition to observing a low conductivity optimum for **C. invisitatus**, Reavie & Smol (1998) sampled **C. invisitatus** from the epilithon, epiphyton, and the plankton of the St. Lawrence River.

Original Description

Valves circular, diameter 9.2-11.4 **µ**; striae finely punctate, 16/10 **µ**; short submarginal recurved spines in indistinct hyaline interspaces; center of valve finely punctate, irregular.

- **Basionym**

  Stephanodiscus invisitatus

- **Author**

  M.H.Hohn and Hellermann 1963

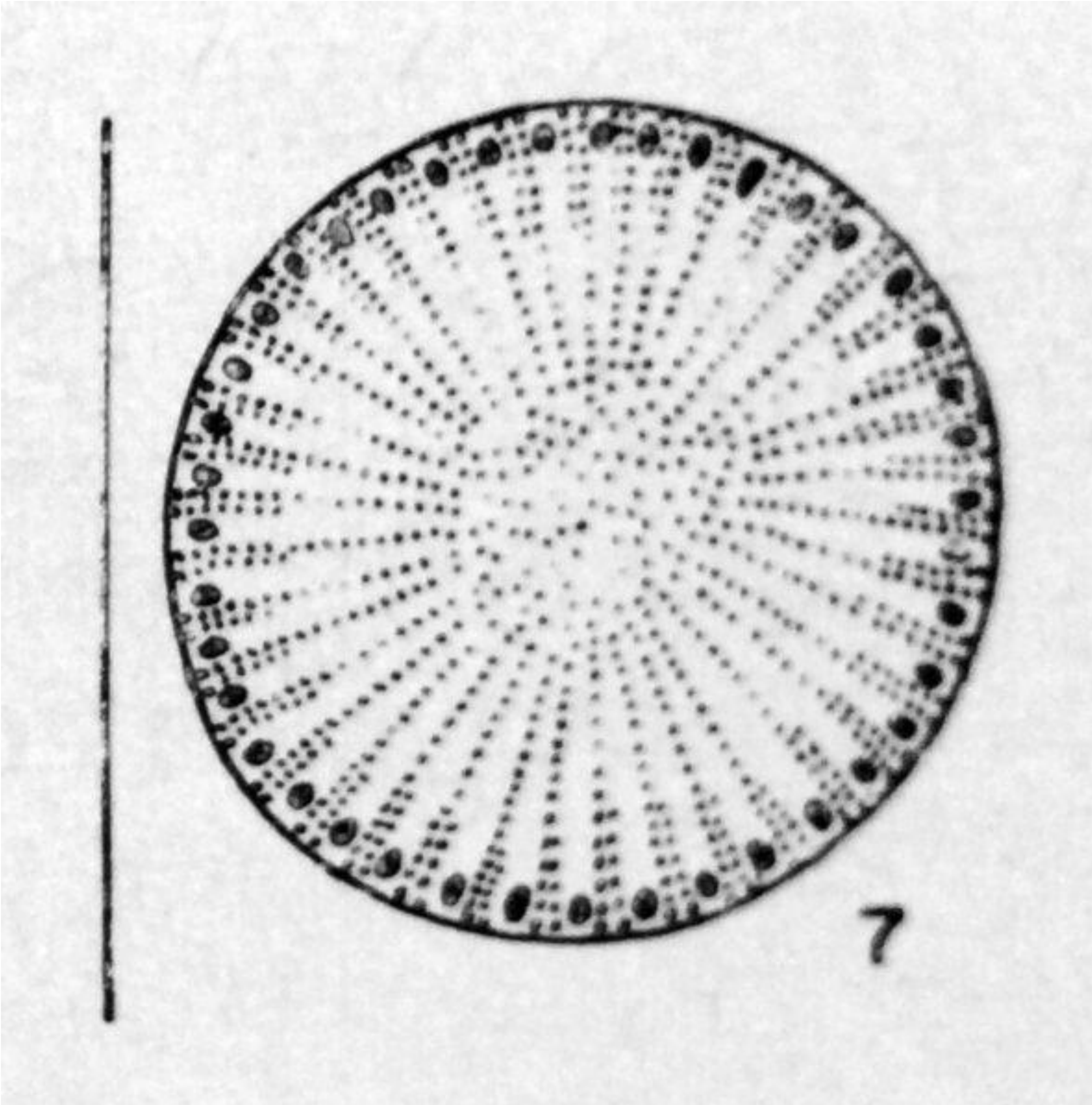
- **Length Range**

  9.2-11.4 µm

- **Striae in 10µm**

  16

Original Images



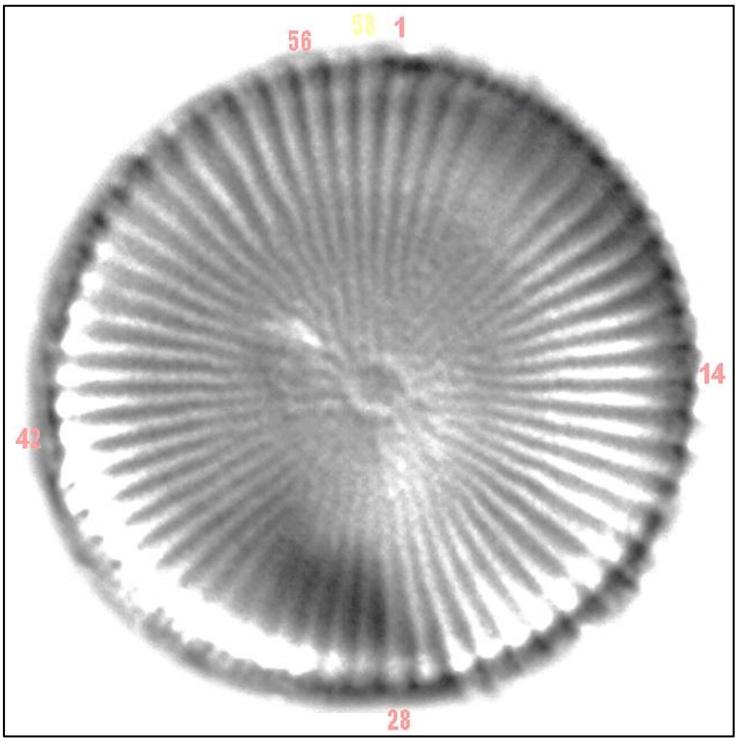
Stephanodiscus invisitatus sp. nov. Pl. I, Fig. 7

Valva orbiculata. Diametros 9.2–11.4 μ. Striis punctatis tenuiter, 16/10 μ. Spinis brevibus, submarginalibus recurvis in interspatiis obscuris pellucidis. Media parte valvae punctata tenuiter, inaequali.

Valve circular; diameter 9.2–11.4 μ; striae finely punctate, 16/10 μ; short submarginal recurved spines in indistinct hyaline interspaces; center of valve finely punctate, irregular.

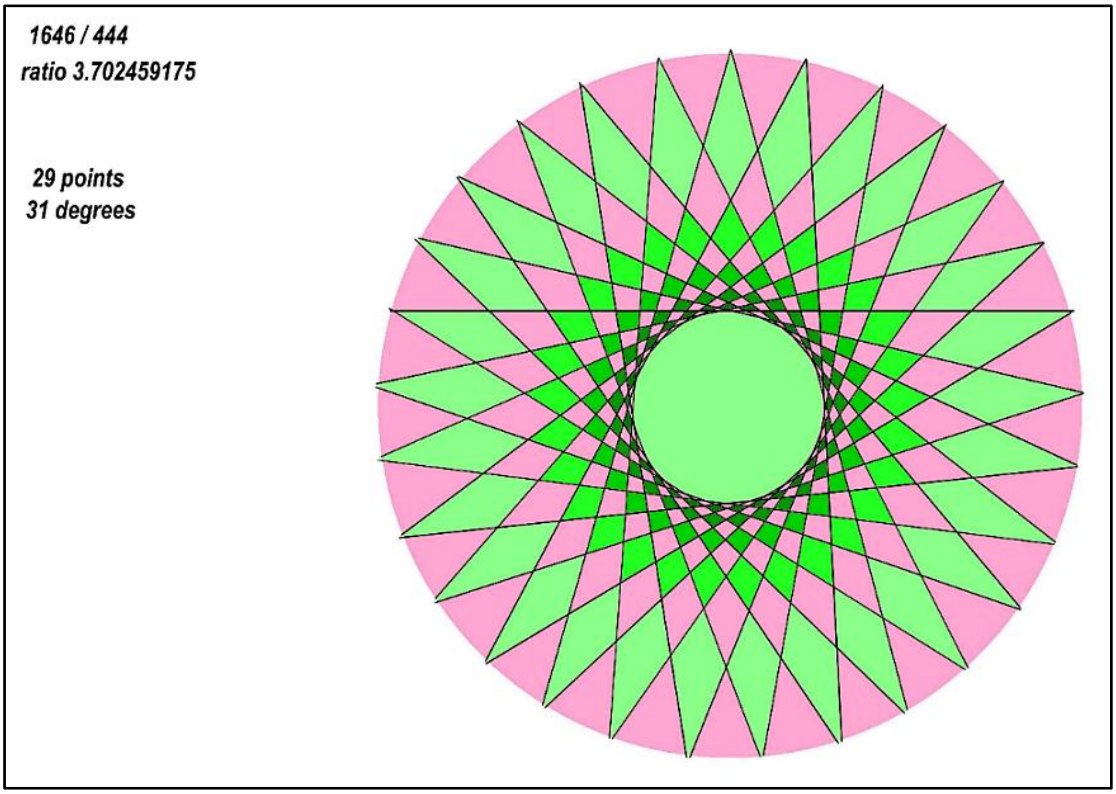
This species resembles *Stephanodiscus astrea* var. *minutula* (Kütz.) Grun. (Syn. Diat. Belg. pl. 95, fig. 7–8, 1881.) but the ornamentation of the valve is much more delicate and the hyaline interspaces are quite indistinct.

Specimen illustrated: G.C. 7059a, holotype. Type locality: Auglaize River, Putman Co., Ohio. Distribution: Type locality, Potomac River, Md. and Ridley Creek, Pa.



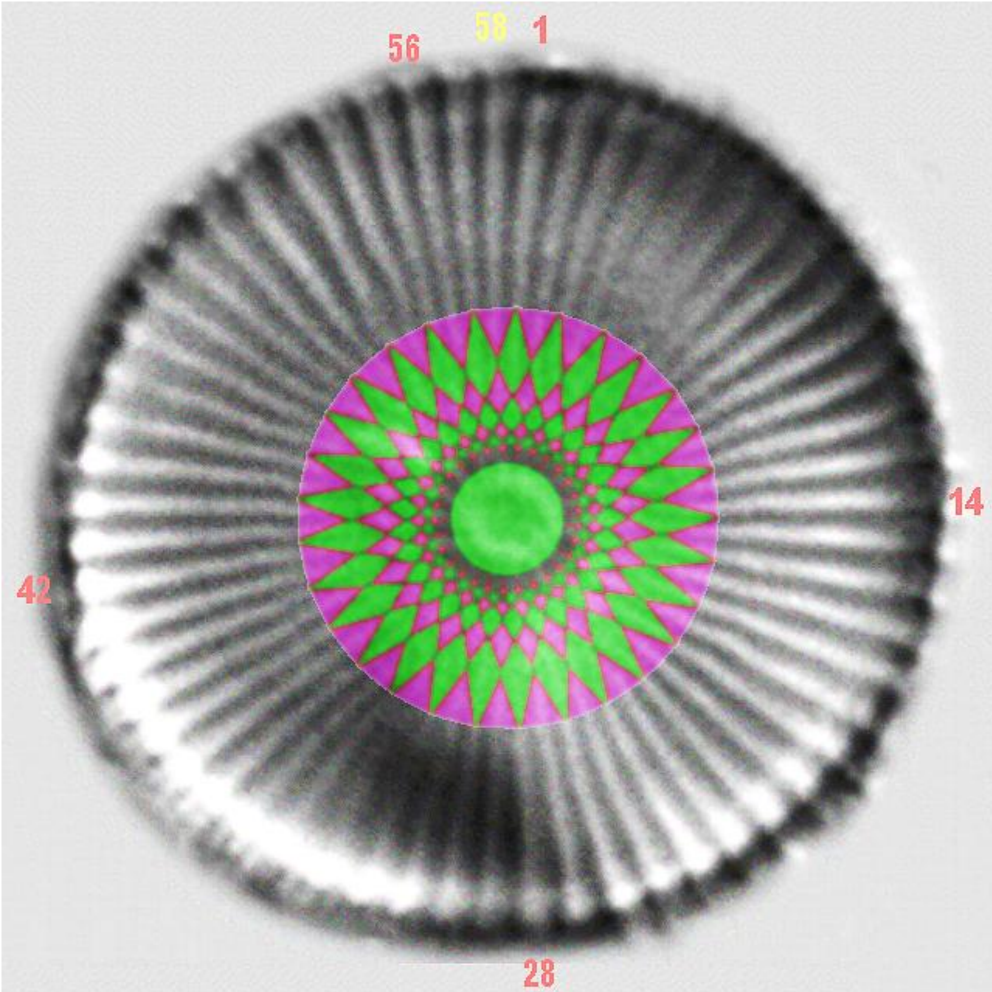
58 POINTS OR 2 x 29 POINTS (PRIME)

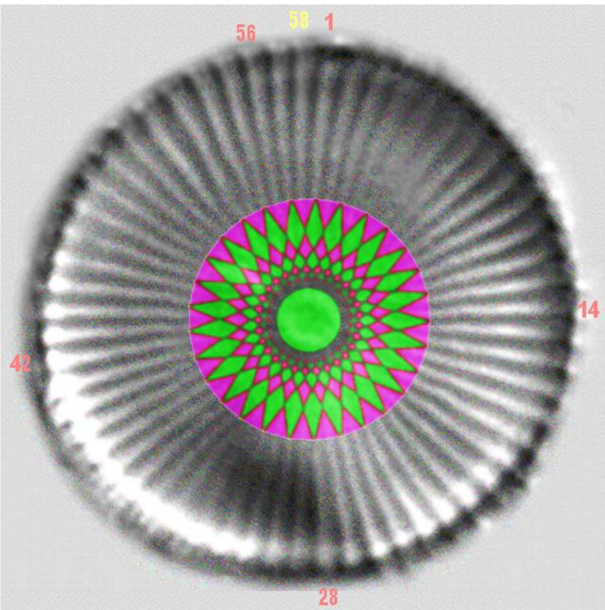
29 POINTS (PRIME)

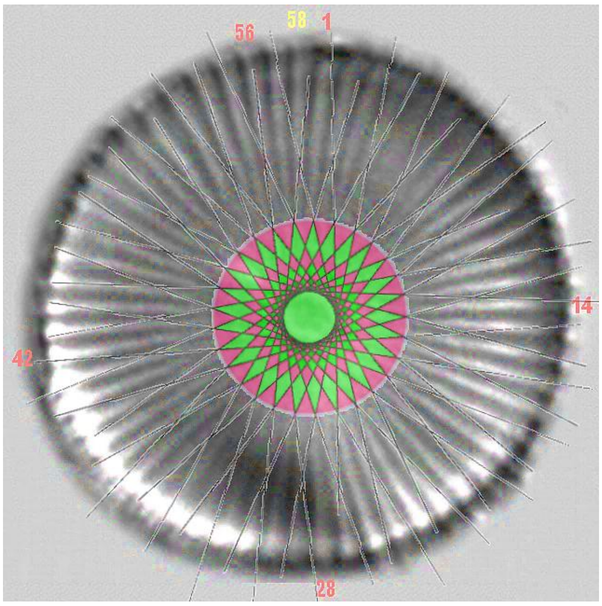


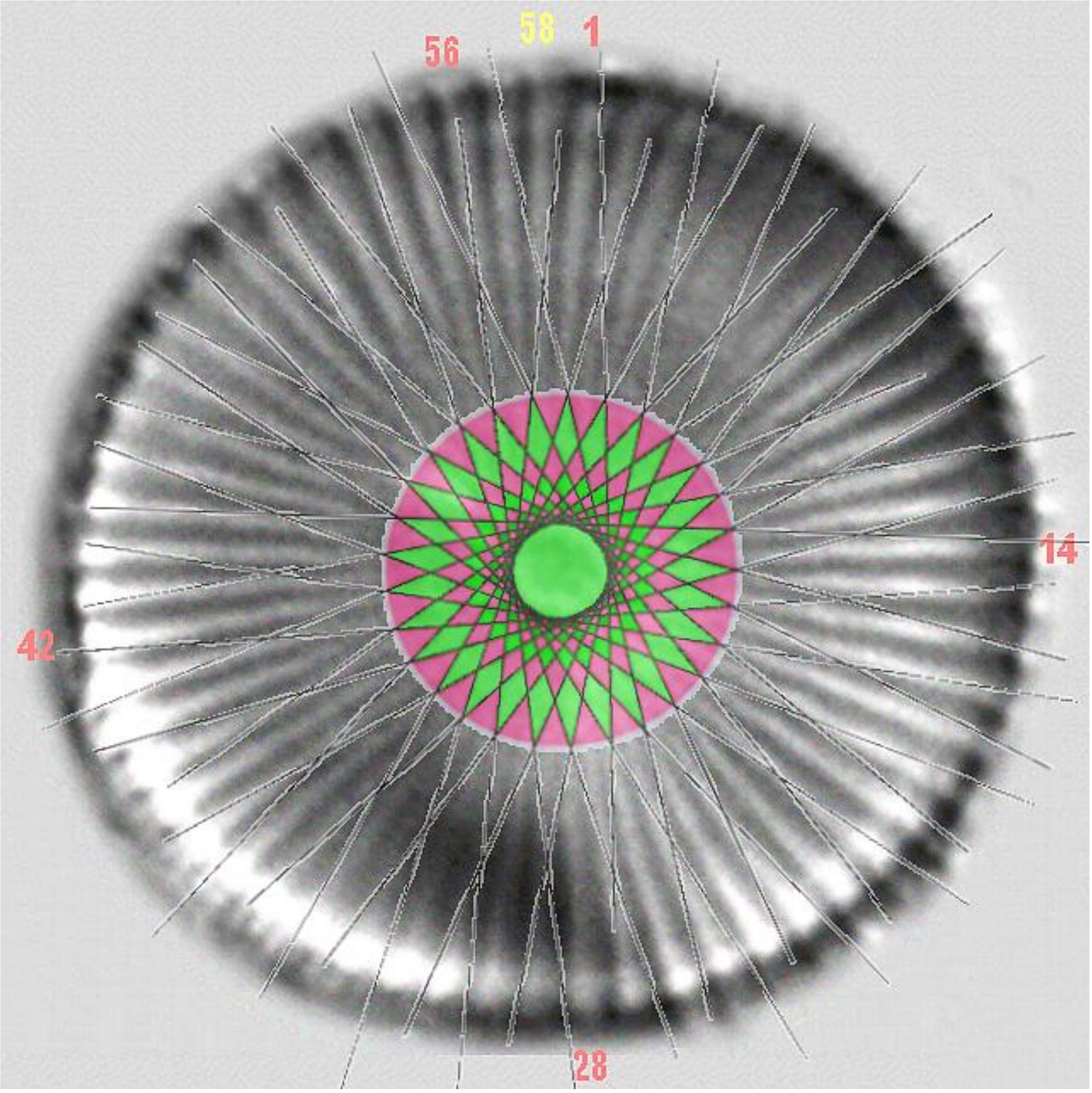
Cyclostephanos invisitatus

2 x 29 points IN PHASE . . . PRIME









MY 29 POINT POLYGRAM EXTENDED

Citations

Edlund, M.B., Engstrom, D.R., Triplett, L.D., Lafrancois, B.M. and Leavitt, P.R. (2009) Twentieth century eutrophication of the St. Croix River (Minnesota-Wisconsin, USA) reconstructed from the sediments of its natural impoundment **Journal of Paleolimnology 41(4): 641-657.**
Publication Link: 10.1007/s10933-008-9296-1

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B: **Stephanodicsus**, **Cyclostephanos**, **Pliocaenicus**, **Hemistephanos**, **Stephanocostis**, **Mesodictyon** & **Spicaticribra**. **In: Poulícková, A. (ed.): Fottea 14 Supplement, 529 pp.**
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Links

Index Nominum Algarum, Original, Transfer
GenBank, Cyclostephanos invisitatus NCBI
North American Diatom Ecological Database, NADED ID: 19002

Cite This Page

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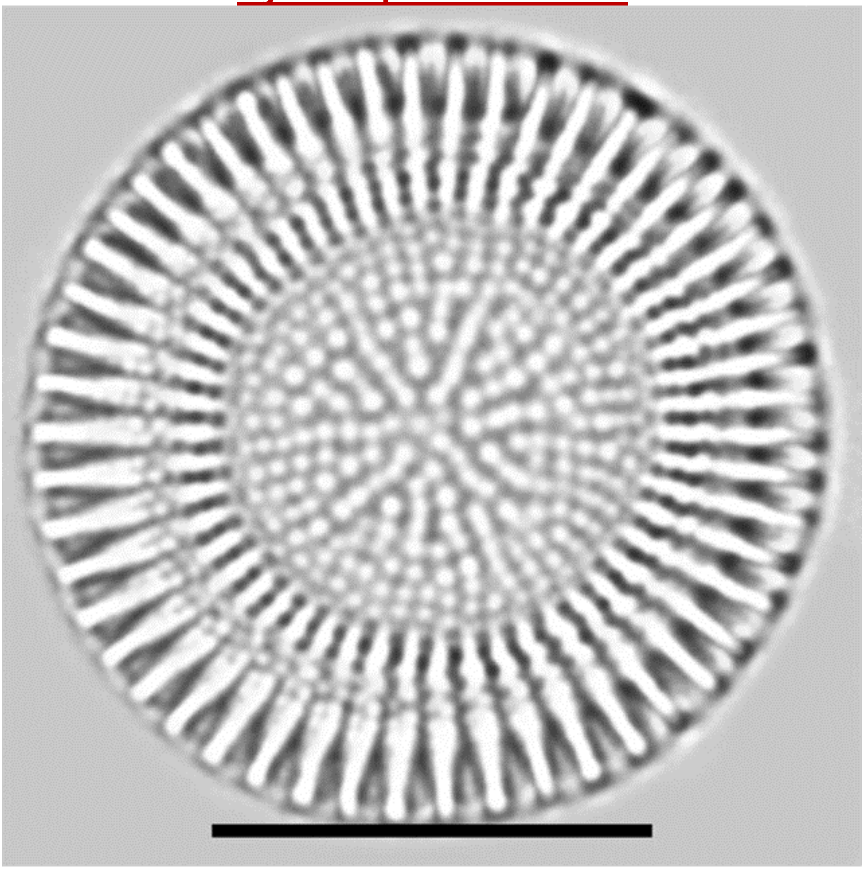
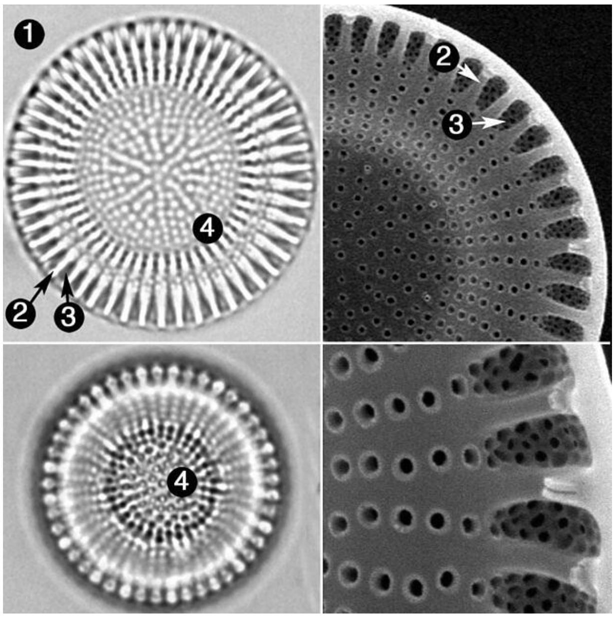
Cyclostephanos dubius



Cyclostephanos dubius Diameter: 8-18

52 points
(or 2 x 26 or 4 x 13 points in phase). PRIME



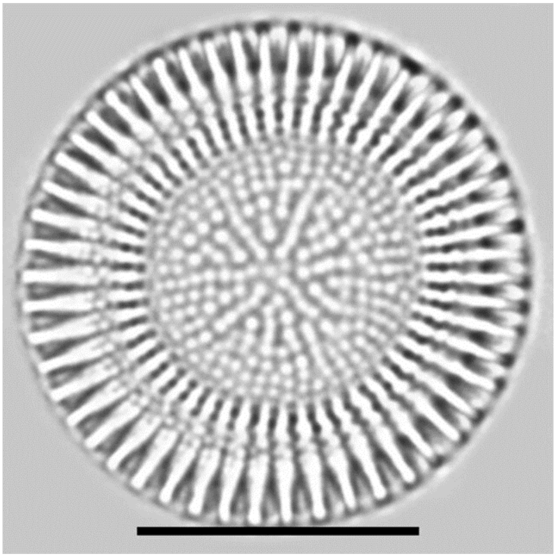
Cyclostephanos dubius
(Fricke) Round in E.C.Ther. et al. 1987

1. Valve concentrically undulate
2. **Marginal costae** distinct
3. **Alveoli** distinct
4. **Central areolae** organized or scattered

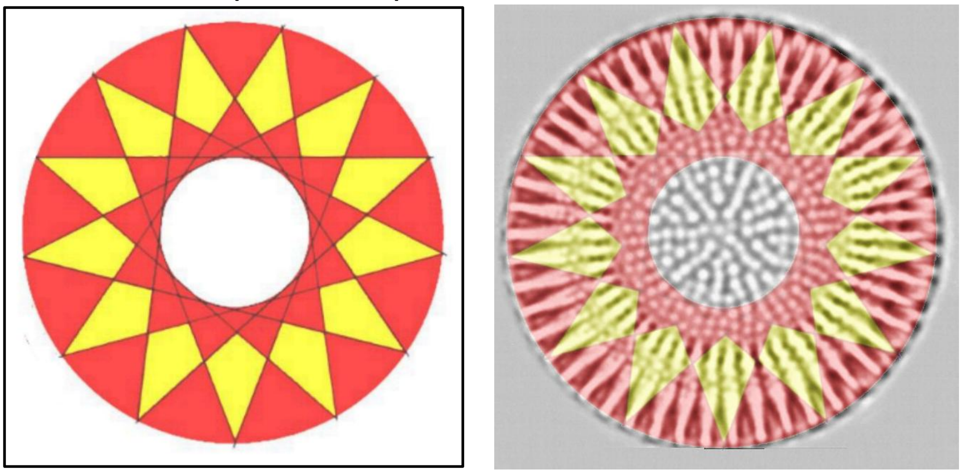
Valves are strongly concentrically undulate. Marginal costae alternate with marginal chambers, called alveoli.

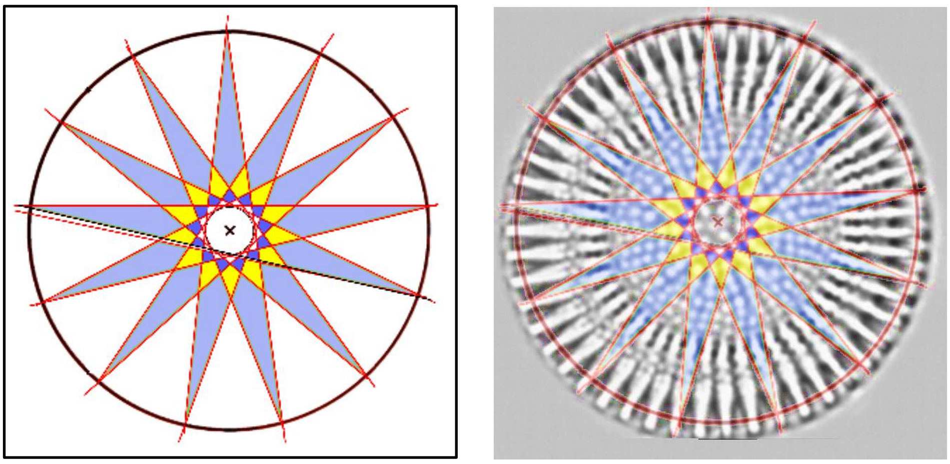
The central areolae of large specimens are often organized into striae, while the central areolae of smaller specimens are more irregular and scattered. Spines are absent.

Cyclostephanos dubius



4 x 13 points in phase – A PRIME DIATOM

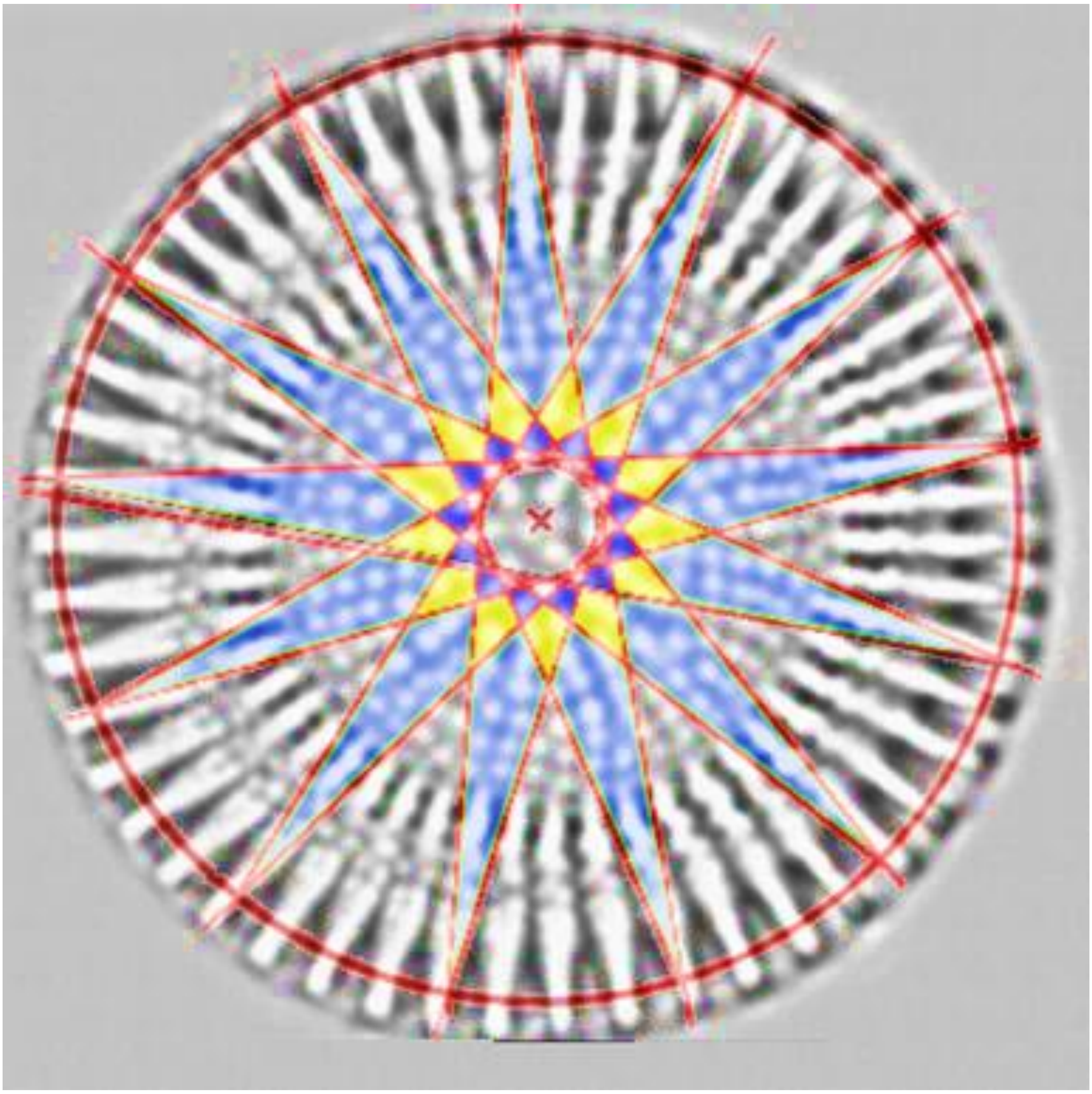




13 POINTS, RATIO 8.0000000000

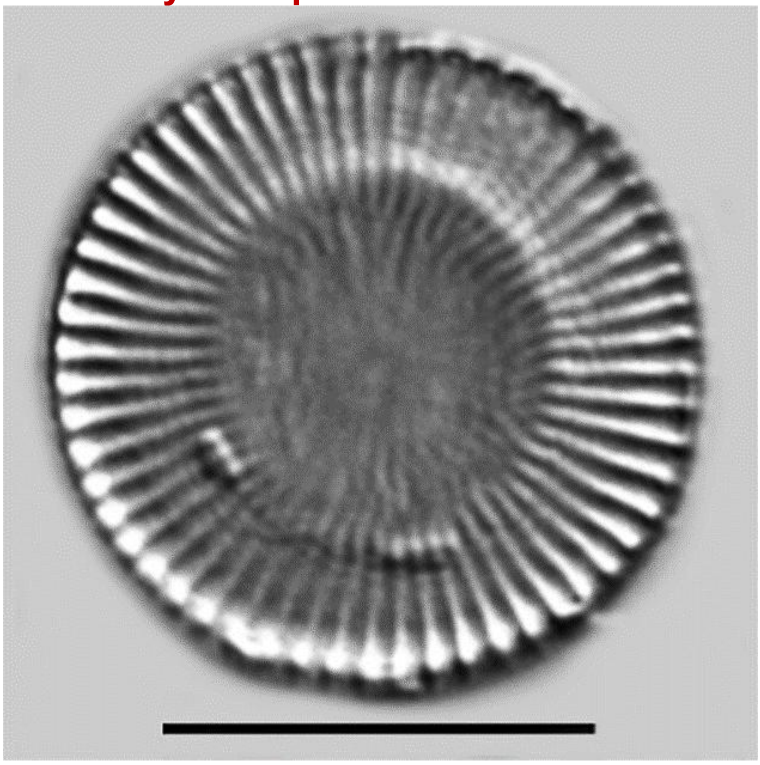
Cyclostephanos dubius

4 x 13 points in phase – A PRIME DIATOM



13 POINTS, RATIO 8.0000000000

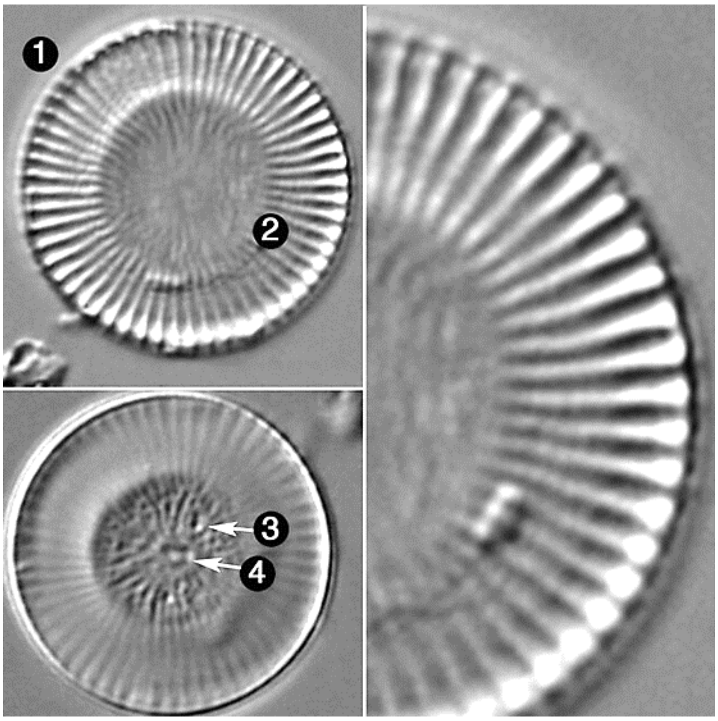
Cyclostephanos tholiformis



Cyclostephanos tholiformis Diameter: 9-15

57 points PRIME

Cyclostephanos tholiformis



Cyclostephanos tholiformis

Stoermer, Håk. and E.C.Ther. 1987

1. Valves concentrically undulate
2. Fascicles weakly organized in the central area
3. Annulus present
4. **Central fultoportulae** 1-3

Valves are small and concentrically undulate. One to three central **fultoportulae** are present. **Striae** are arranged in fascicles, which radiate from a central annulus.

Fascicles are ***uniseriate*** and weakly organized in the central area, becoming ***multiseriate*** near the valve margin.

Description

Valves are small, with a concentrically undulate face and an annulus in the valve center. Areolae are difficult to resolve in LM. In the central area, areola are weakly organized near the annulus and then become organized into fascicles toward the margin. Fascicles are uniseriate near the valve center and become multiseriate near the margin. The number of total **fascicles** ranges from 26 to 55 and decreases with valve diameter. One to 3 central fultoportulae may present.

Cyclostephanos tholiformis and C. delicatus are indistinguishable in LM and they co-occur (Håkansson and Kling 1990). According to Håkansson and Kling, **C. tholiformis** is distinguished by one to three central fultoportula, interfascicles that branch on the mantle interior, marginal fultoportulae beneath every third to fourth spine and two satellite pores at each fultoportula.

In contrast, **C. delicatus** has only one central fultoportula, internal fascicles on the mantle are non-branching, marginal fultoportulae occur beneath every fourth to sixth spine and three satellite pores at each fultoportula.

Cyclostephanos tholiformis

DIATOM FEATURES AS DESCRIBED BY TAXONOMISTS
ARE ACTUALLY FEATURES OF PLANE REGULAR SHAPE

Annulus in the valve center — The **Inscribing Circle** from Plane Regular Shape Theory

Areolae	weakly organized near the annulus	**Central spots**
Fascicles	radiate from a central annulus	**Radials or Apexes**
Fultoportulae	Central inverts or dots. Or imperfections.	
Striae	arranged in fascicles, which **radiate** from a central annulus	**Radials or Apexes**

DIATOM FEATURES DESCRIBED	**PLANE REGULAR SHAPE FEATURES**
Valve concentrically undulate	**outer striates (centres of apexes)**
Marginal costae distinct	
Alveoli distinct	**valleys between outer striates (distance between apexes)**
Central areolae organized or scattered	**Central spots**
Valves are strongly **concentrically** undulate.	**Shapes are formed by concentric circles.**

Marginal costae alternate with **marginal chambers, called alveoli**

Outer striates alternate with valleys between. — **Apexes alternate with gaps**.

TIME TO CALL A SPADE A SPADE!

Citations

Edlund, M.B., Engstrom, D.R., Triplett, L.D., Lafrancois, B.M. and Leavitt, P.R. (2009) Twentieth century eutrophication of the St. Croix River (Minnesota-Wisconsin, USA) reconstructed from the sediments of its natural impoundment **Journal of Paleolimnology 41(4): 641-657.**
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Links

Index Nominum Algarum, Original, Transfer
GenBank, Cyclostephanos invisitatus NCBI
North American Diatom Ecological Database, NADED ID: 19002

Cite This Page

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3 Additional Cyclostephanos species

Cyclostephanos costatilimbus
Cyclostephanos damasii
Cyclostephanos delicatus

ATTEMPTING TO FORM AND ANALYSE A POSSIBLE CONNECTION BETWEEN DIATOMS AND MY SHAPE TO MUSIC CORRELATION ANALYSIS.

	SORTED BY ↓	SHAPE TO MUSIC (to DIATOM) CORRELATION					BEST CHOICE	WITH DIATOMS		
Note	Music FREQ / 100	DEGREES	SHAPE	Shape Ratios Ratios including refined results	Shape Harmonic Multipliers	Shape / Music Differential Harmonics	Shape Ratios Primary / Secondary	DIATOM & SHAPE Points	DIATOM Genus	DIATOM Species
A_3										
	2.200000000000120	52	45pts 52deg	2.288245611270730	1.080363026950910	1.040111641486640		15 / 45 / 60	Asterolampra	Aemulans
C_2#	1.385913154884390	90	Square	1.414213562373100	1.080363026950910	1.020420043917590				
G_2	1.959977179908830	60	Equl Tri	2.000000000000000	1.080363026950910	1.020420043917570				
G_3	3.919954359817880	29.032258000	31pts 29deg	4.000000000000000	1.080363026950910	1.020420043917510	31 pts	31 pts	Cyclostephanos invisitatus	
				√2 x √2 x √2 x √2						
G_4	7.839908719636170	13.846153850	13 pts	8.000000000000000	1.080363026950910	1.020420043917460	13 IN PHASE twice	13 / 26	Cyclostephanos Dubius	
				√2 x √2 x √2 x √2 x √2 x √2						
C_3#	2.771826309768920	41.538461540	13 pts	2.828427124746190	1.080363026950910	1.020420043917540	13 IN PHASE twice	13 / 26	Arachnoidiscus	Deficiens
				√2 x √2 x √2						
C_4#	5.543652619538130	20	Nonogram	5.656854249492380	1.080363026950910	1.020420043917480	9 IN PHASE twice	9 / 18 / 36	Arachnoidiscus	Indicus / Lepidus
				√2 x √2 x √2 x √2 x √2						
					Septagram					
A_4	4.400000000000470		Septagram	4.576491222541460	1.080363026950910	1.040111641486580		7, 14, 28, 56, 112	Arachnoidiscus	Oamaruensis
				4.576491222541460						
				1.414213562373100						
				3.236067977	Pentagram					
D_3#	3.111269837221060	36	Pentagram	3.236067977499770	1.080363026950910	1.040111641486610				
				1.414213562373100						
				2.288245611	45pts 52deg					
A_3	2.200000000000120	52	45pts 52deg	2.288245611270730	1.080363026950910	1.040111641486640		15 / 45 / 60	Asterolampra	Aemulans
				1.414213562373100						
				1.618033989	Golden Mean					
D_2#	1.555634918610450		Golden Mean	1.618033988749890	1.080363026950910	1.040111641486670				
				1.414213562373100						
				1.144122806						
D_3	2.936647679174300	39.130434780	23 pts	2.995352392457270	1.059016994374940	1.019990383490430		23 / 46	Arachnoidiscus	Ehrenbergii
	2.936647679174300	39.130434780	23 pts	2.995352392457270	1.059016994374940	1.019990383490430		23 / 46	Melosira	Clavigera
D_2	1.468323839587070	84	15pts	1.497676196228630	1.059016994374940	1.019990383490480	15pt 84deg	15 / 45 / 60	Asterolampra	Aemulans
F_2#	1.849972113558250		60pts	1.851229586821910	1.059016994374940	1.000679725523670	60pt	15 / 45 / 60	Asterolampra	Aemulans

My initial respose to these early results is that Diatoms may correlate with my *“Music to Shape Harmonics”.*

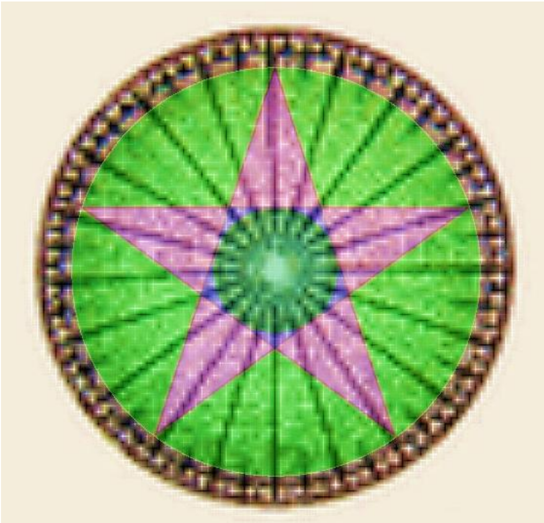
There is correlation with *“Shape Harmonic Multipliers” and with “Shape to Music Differential Harmonics”.*

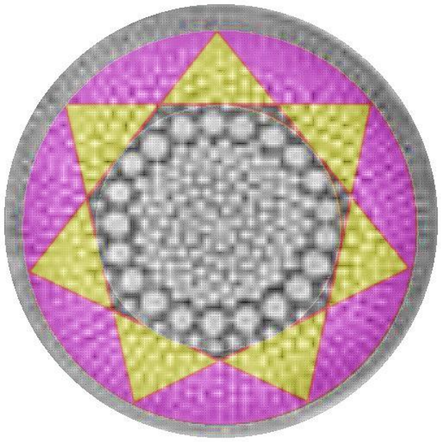
In some cases a common Multplier **√2** seems to be relevant.

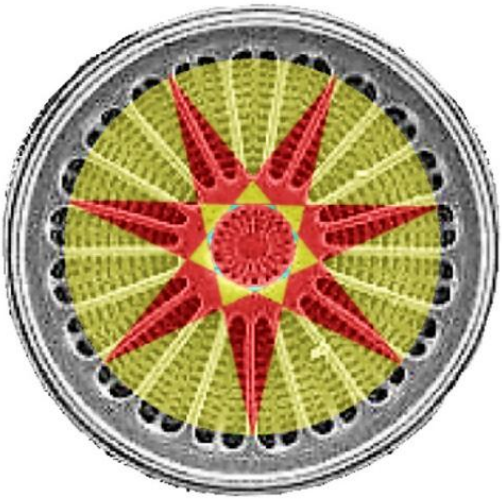
AT THIS STAGE WE SHOULD QUESTION WHETHER PLANE REGULAR SHAPE AND PRIMES ARE APPLICABLE TO THE STUDY OF DIATOMS.

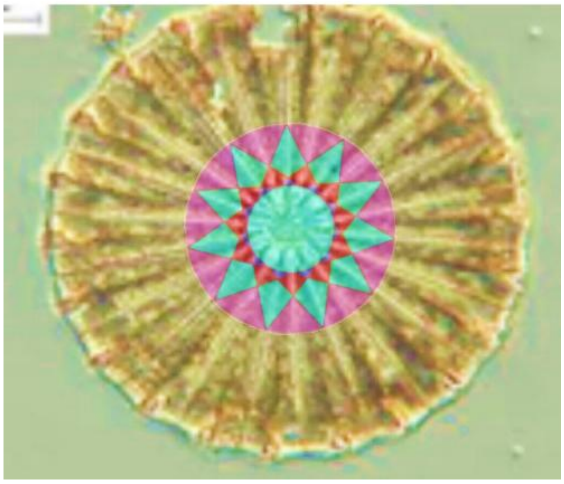
Noting that I have already established a form of mathematics and harmonics associated with the formation of and application of Plane Regular Shape.

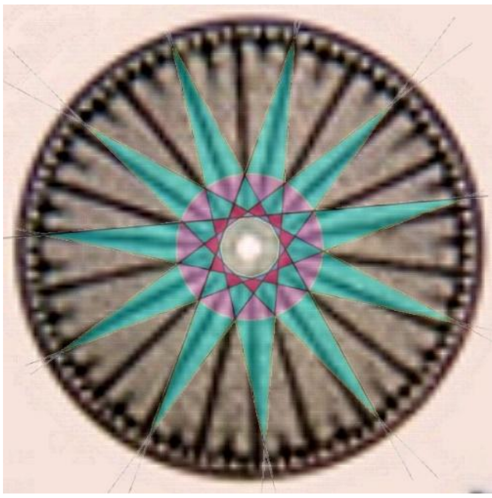
DIATOMS AND PLANE REGULAR SHAPE

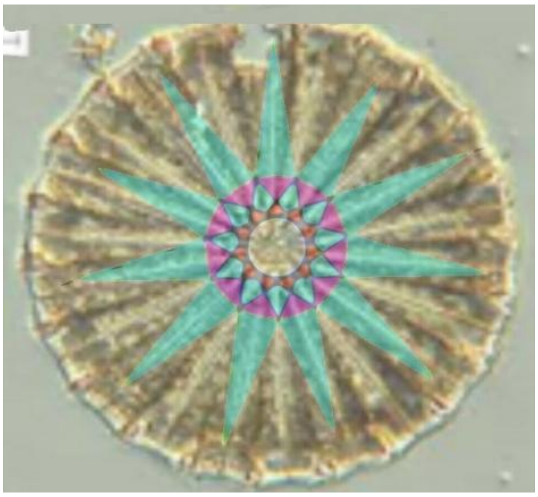


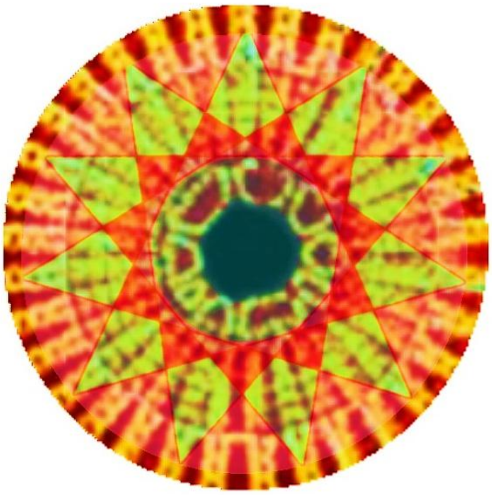


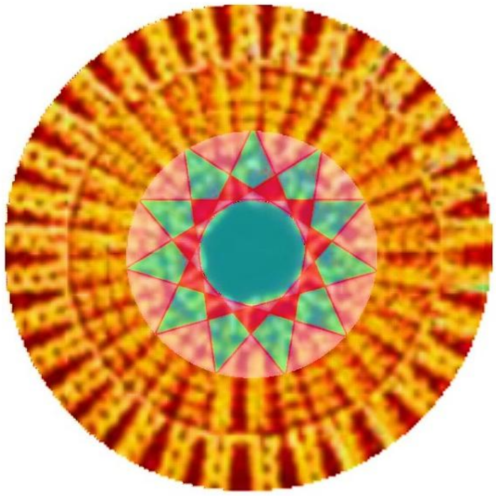


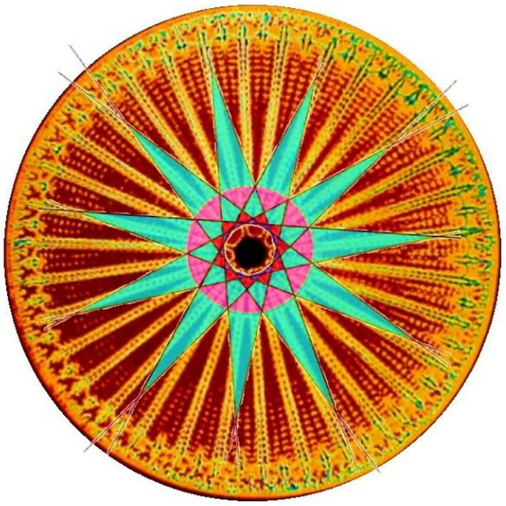


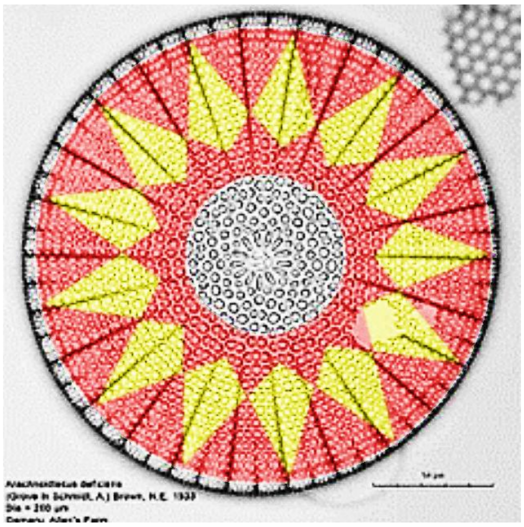


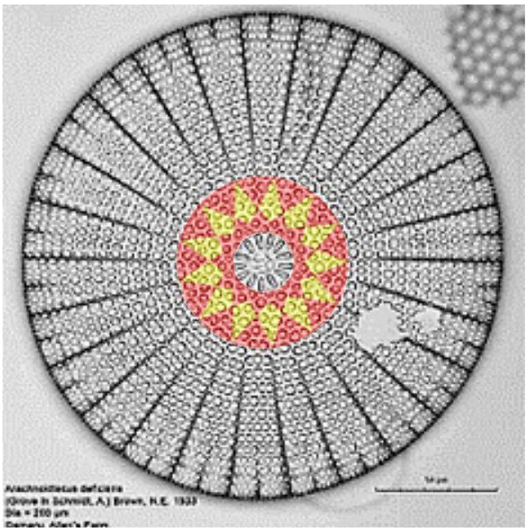


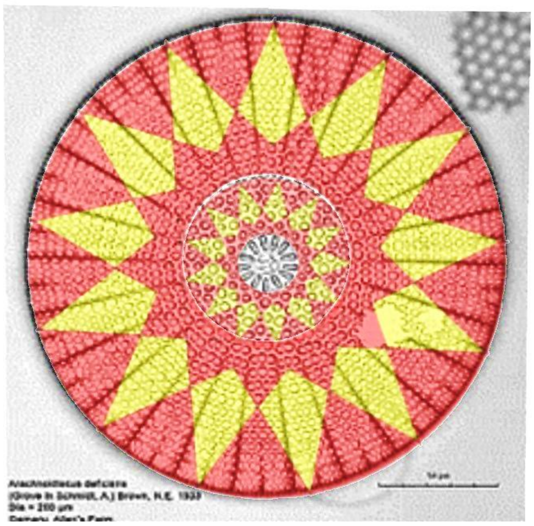


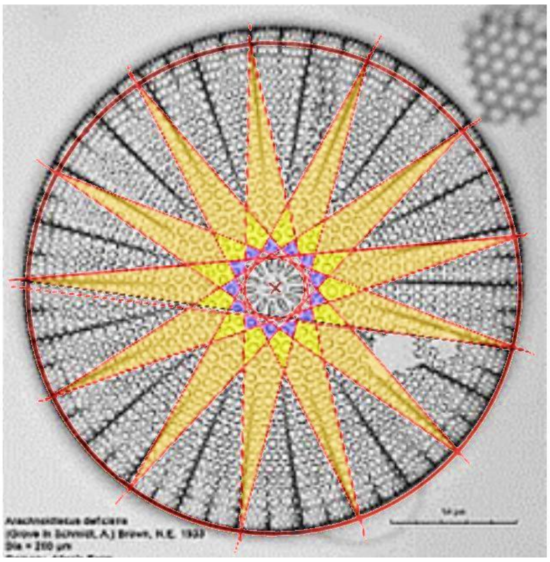


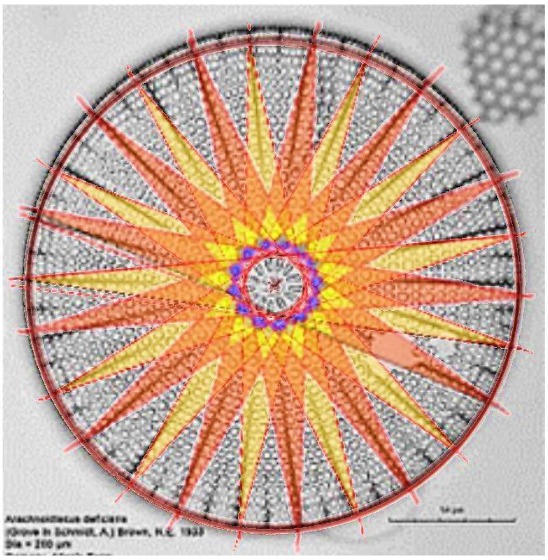


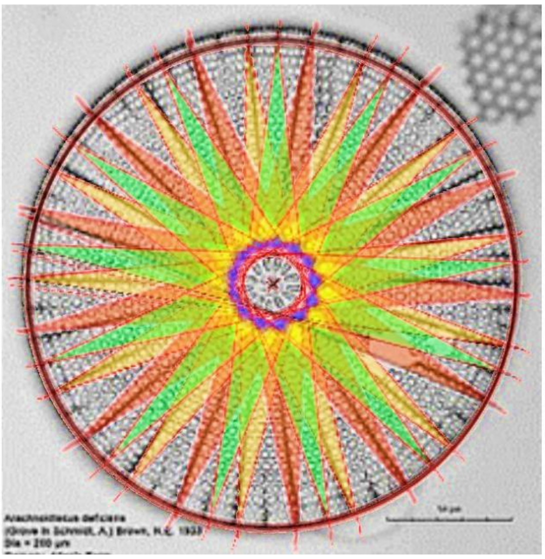


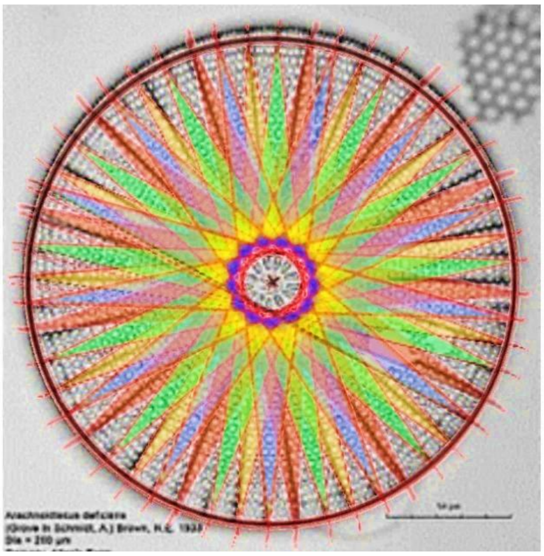


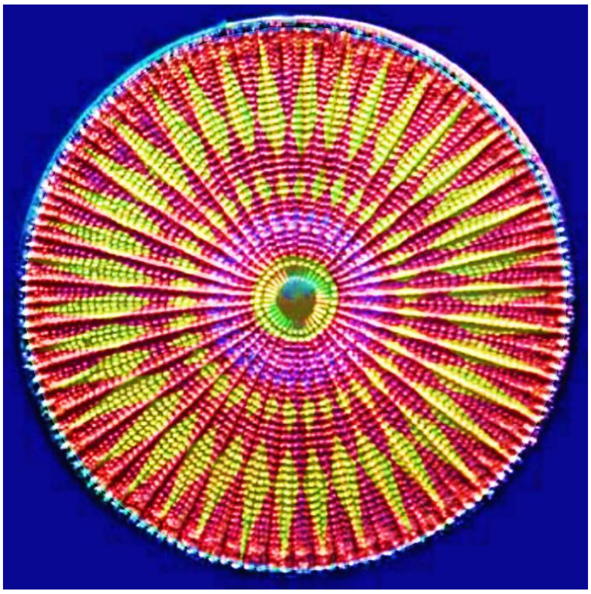


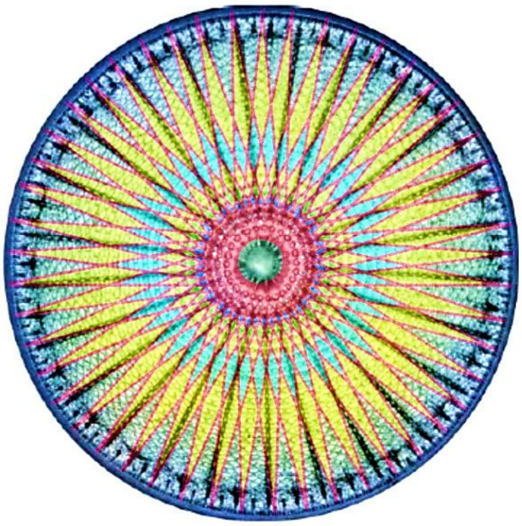


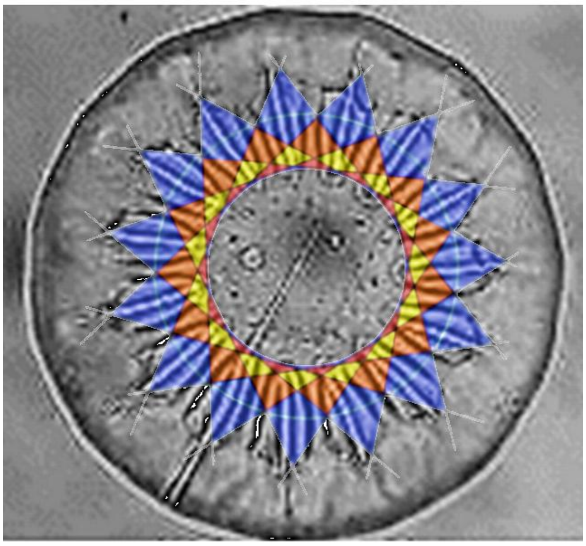


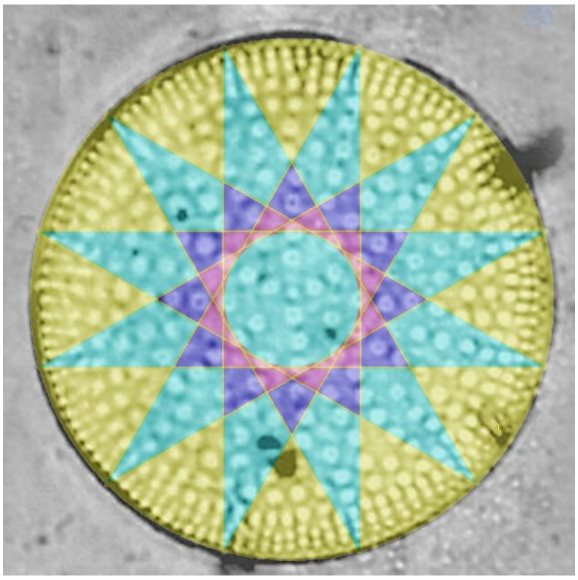


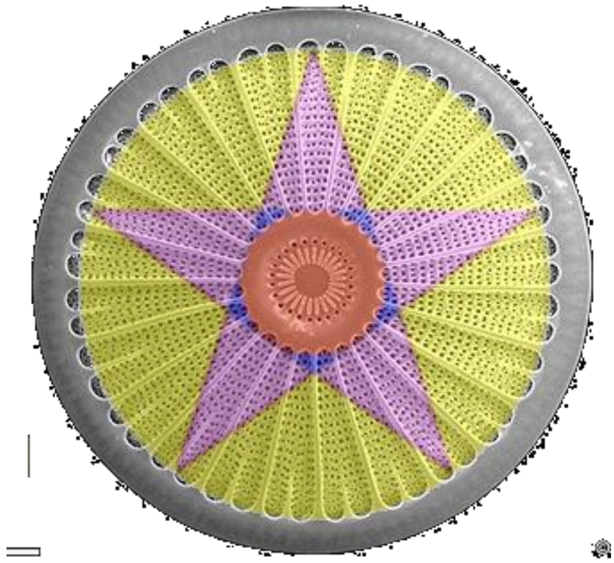


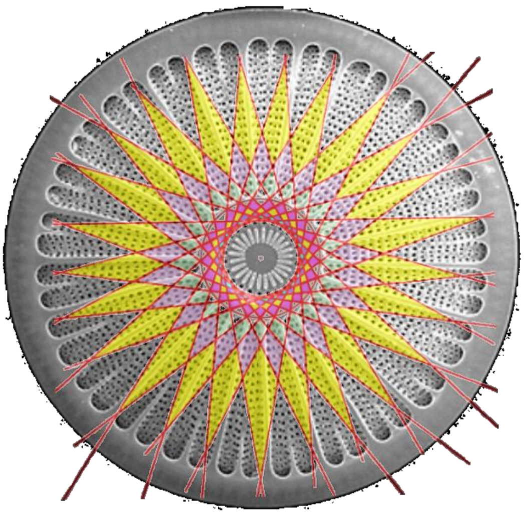


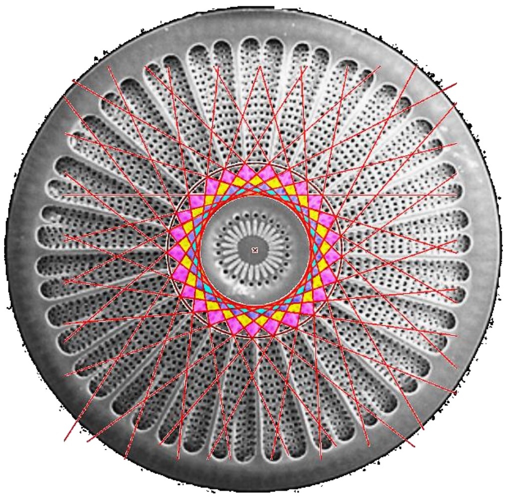


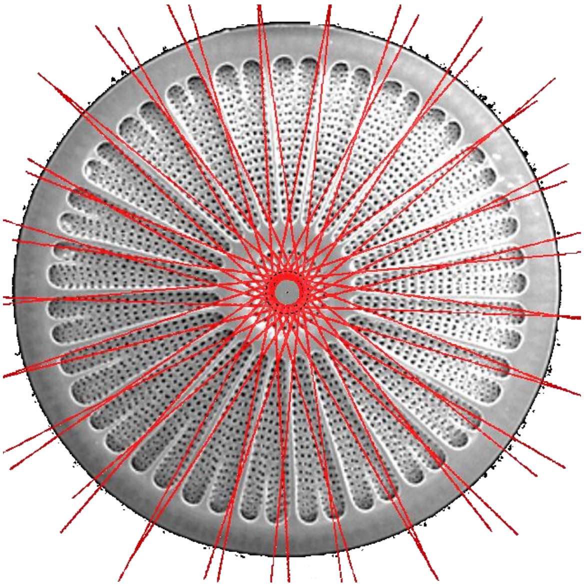


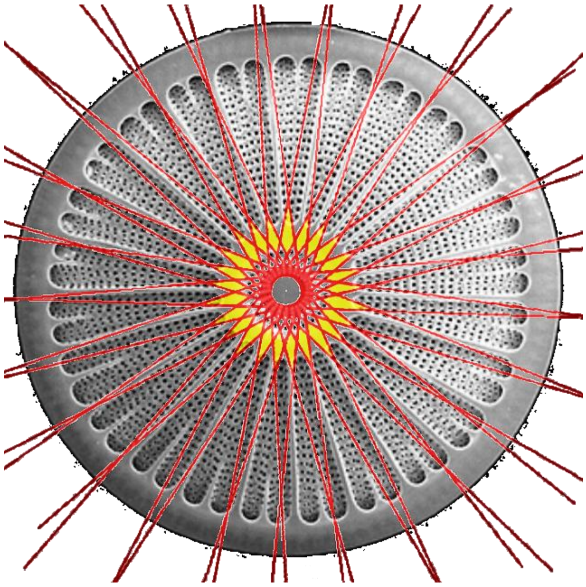


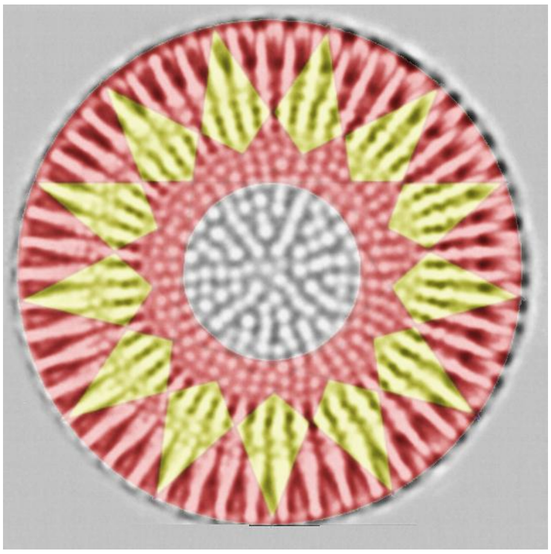


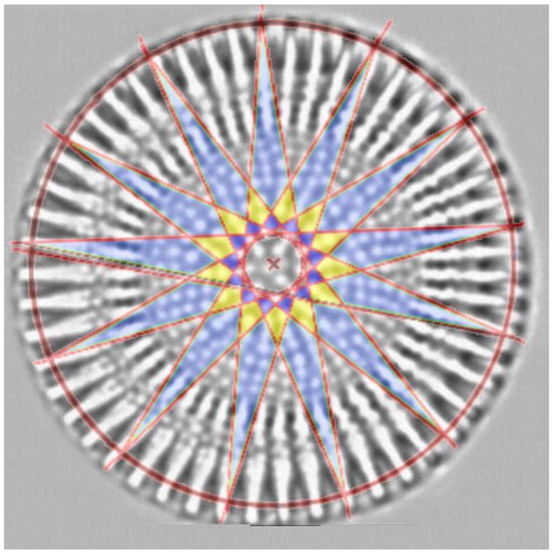


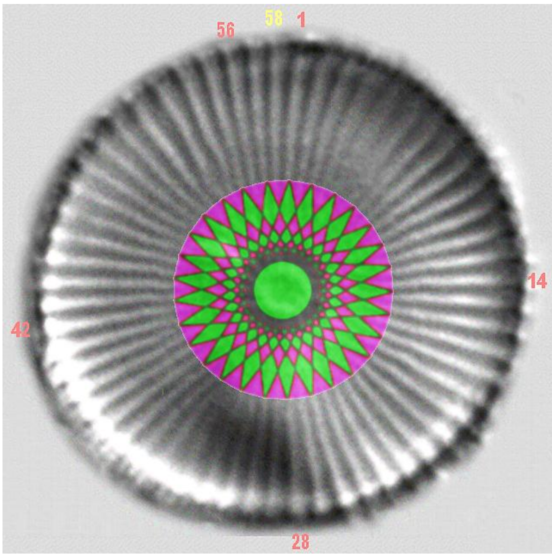








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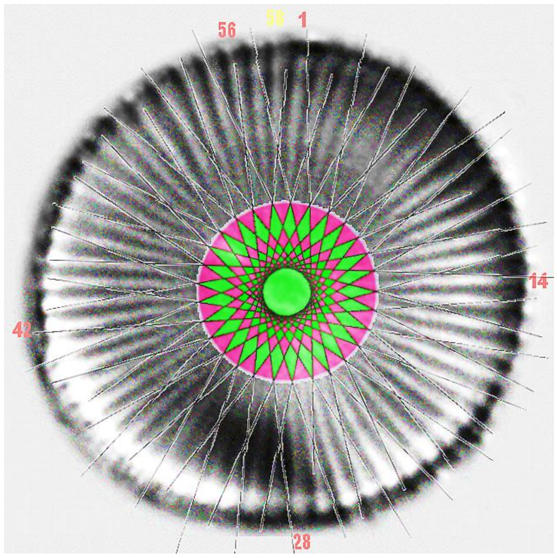
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