

# **P-Adic Analysis in the Age of Big Data**

**1. *Cyber Physical Systems (CPS);***

**2. *“DNA” of Big Data (BD);***

**3. *“Kádon”: the unit of genetic Big Geo Data code of information;***

**4. *Number Mining Algorithms (NUMA).***



# 1. *Cyber Physical Systems (CPS)*

**CPS are networked systems of cyber (computation and communication) and physical (sensors and actuators) components that interact in a feedback loop with the possible help of human intervention, interaction and utilization.**



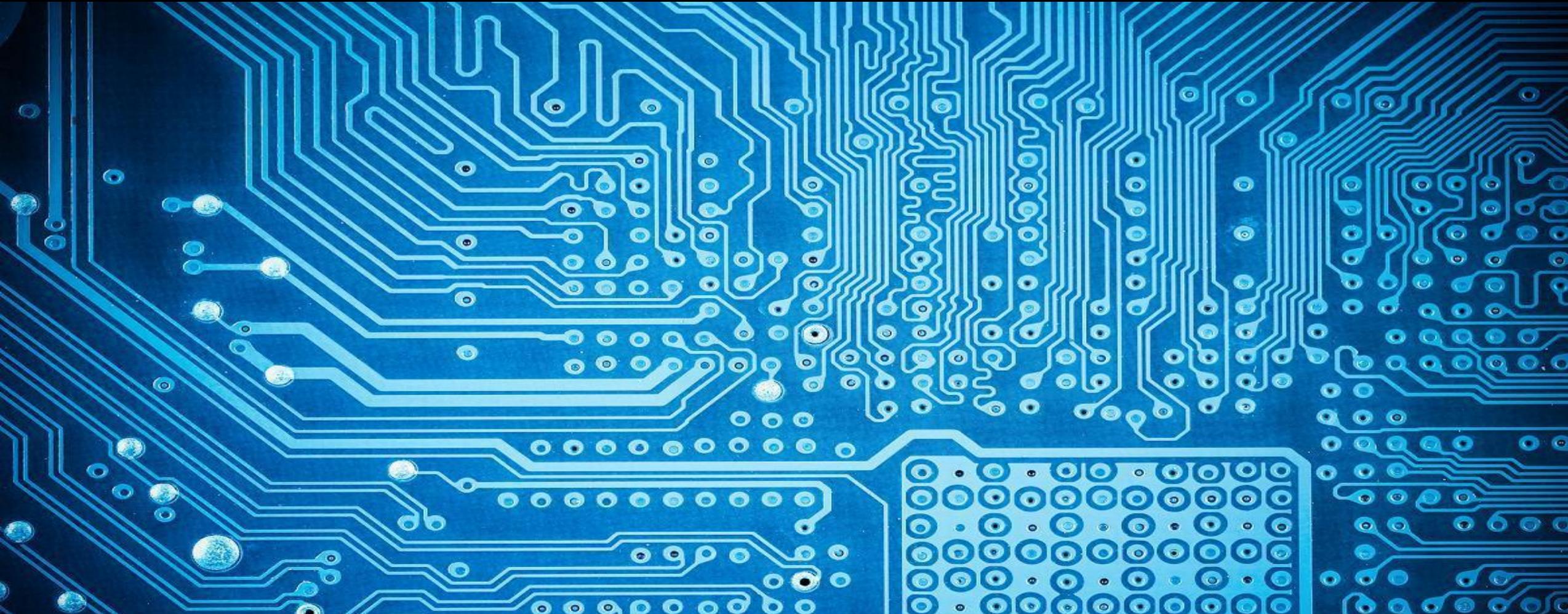
**"SCIENCE AND ENGINEERING ARE BOTH ALL ABOUT *MODELS*"**

# Cyberworld

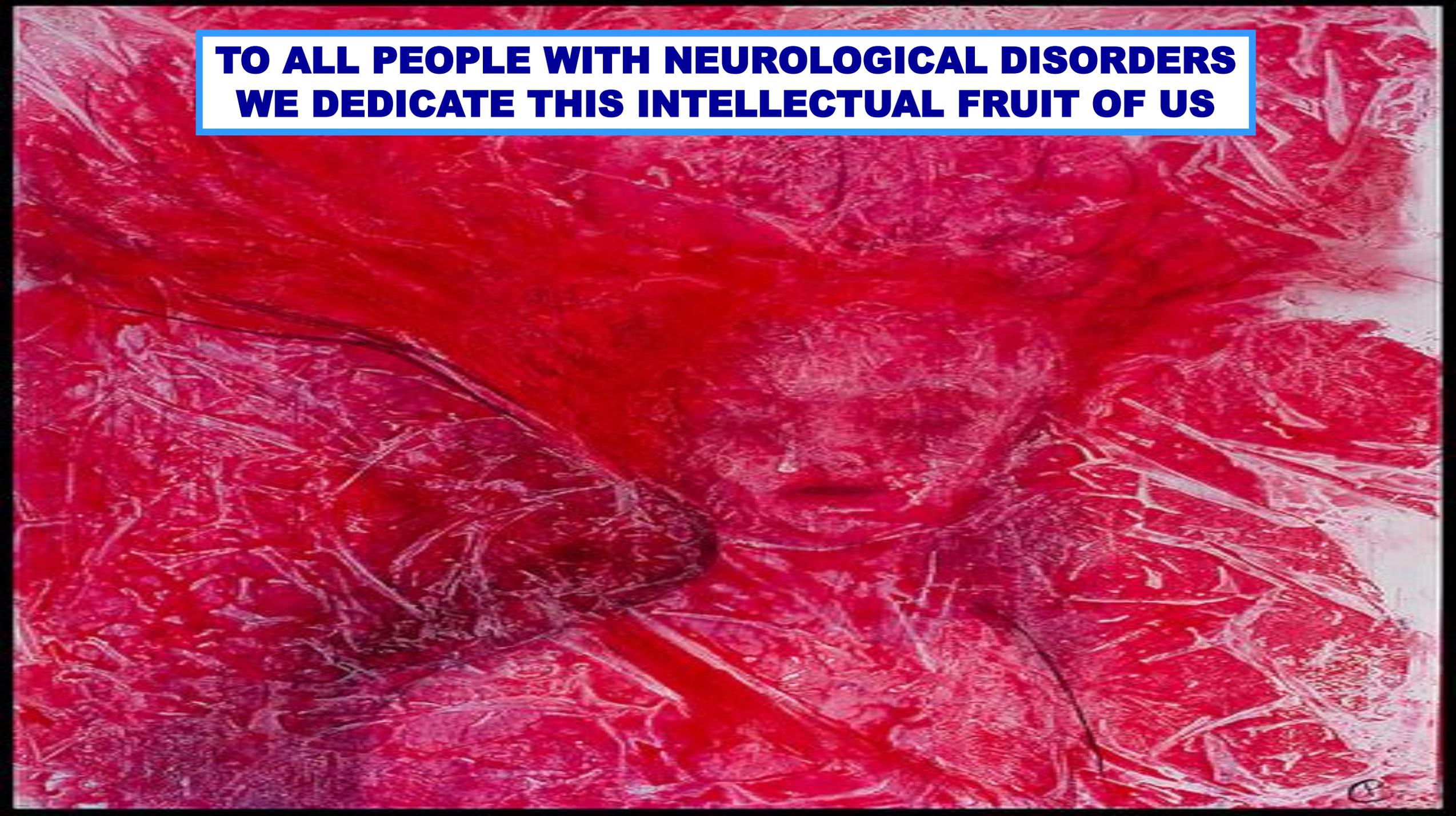




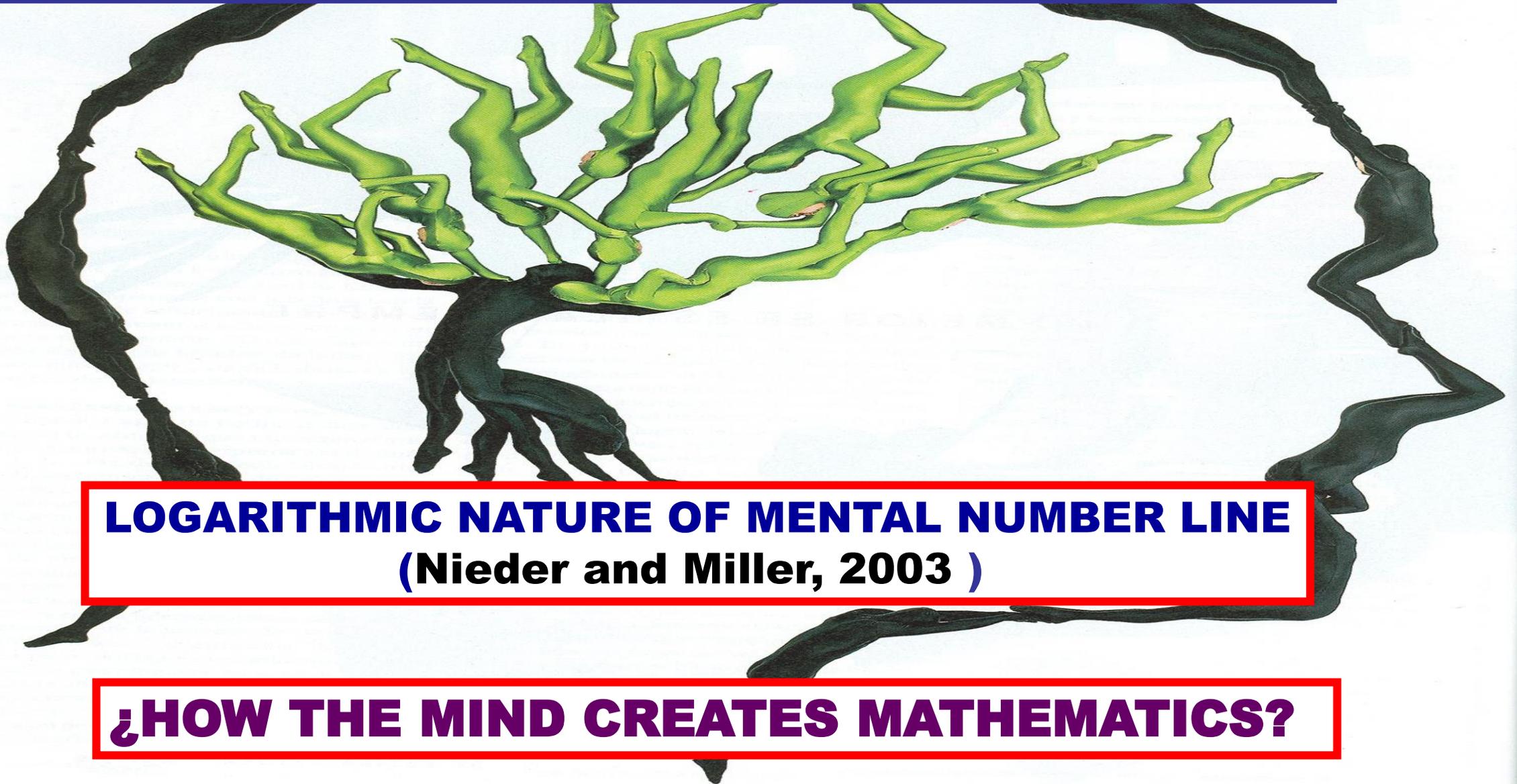
**SYNTON-TECH-9805349956610338735**



**TO ALL PEOPLE WITH NEUROLOGICAL DISORDERS  
WE DEDICATE THIS INTELLECTUAL FRUIT OF US**

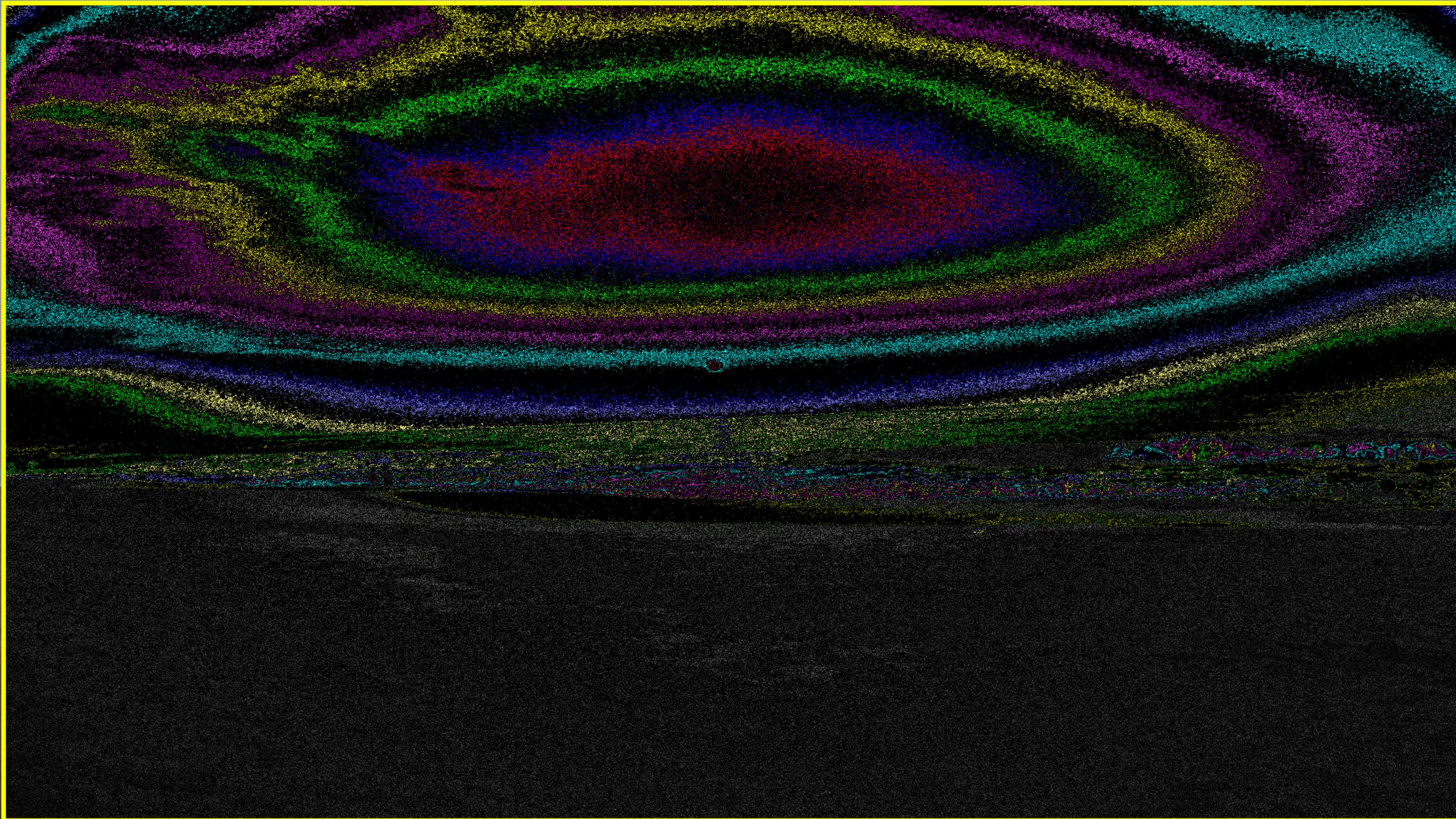


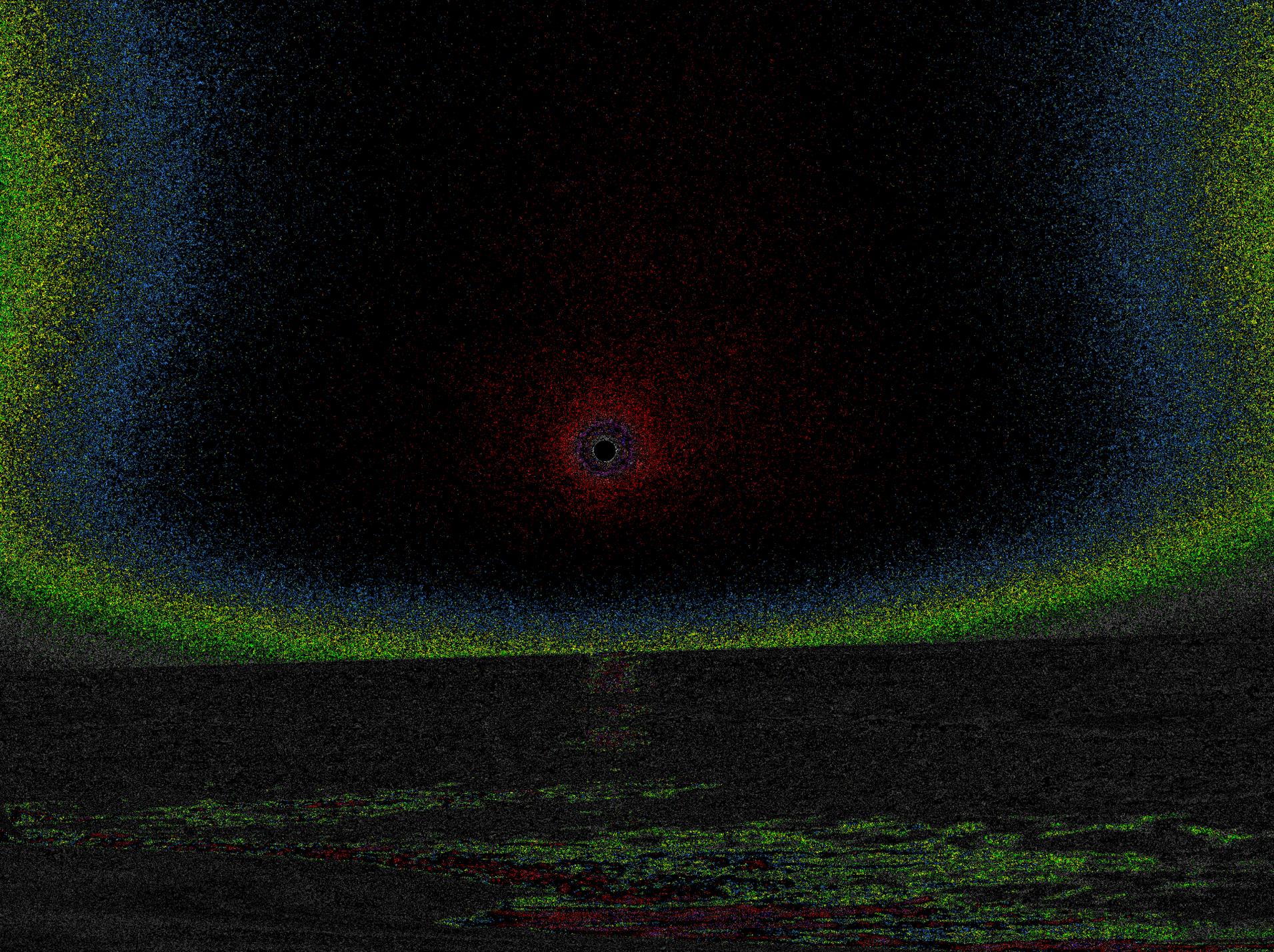
**NEUROIMAGING (Dehaene et al., 2004 )  
AND NUMBER NEURONS (Dehaene, 2003)**



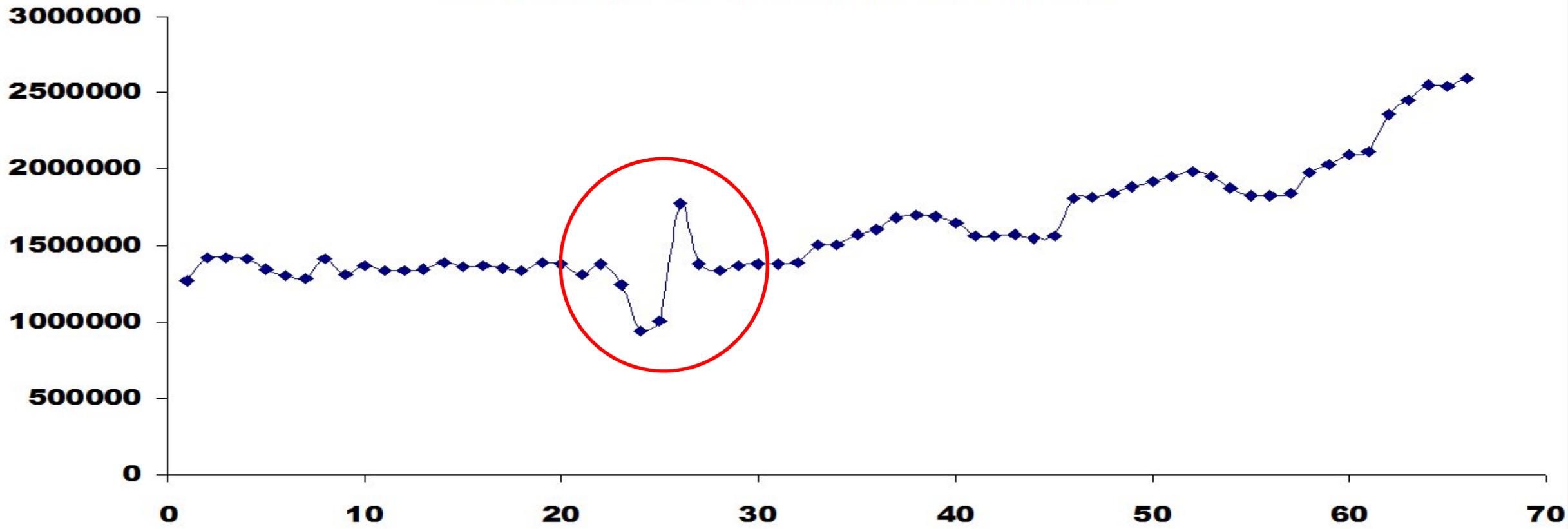
**LOGARITHMIC NATURE OF MENTAL NUMBER LINE  
(Nieder and Miller, 2003 )**

**¿HOW THE MIND CREATES MATHEMATICS?**





# THE DYNAMICS OF NUMBER OF PRIMES



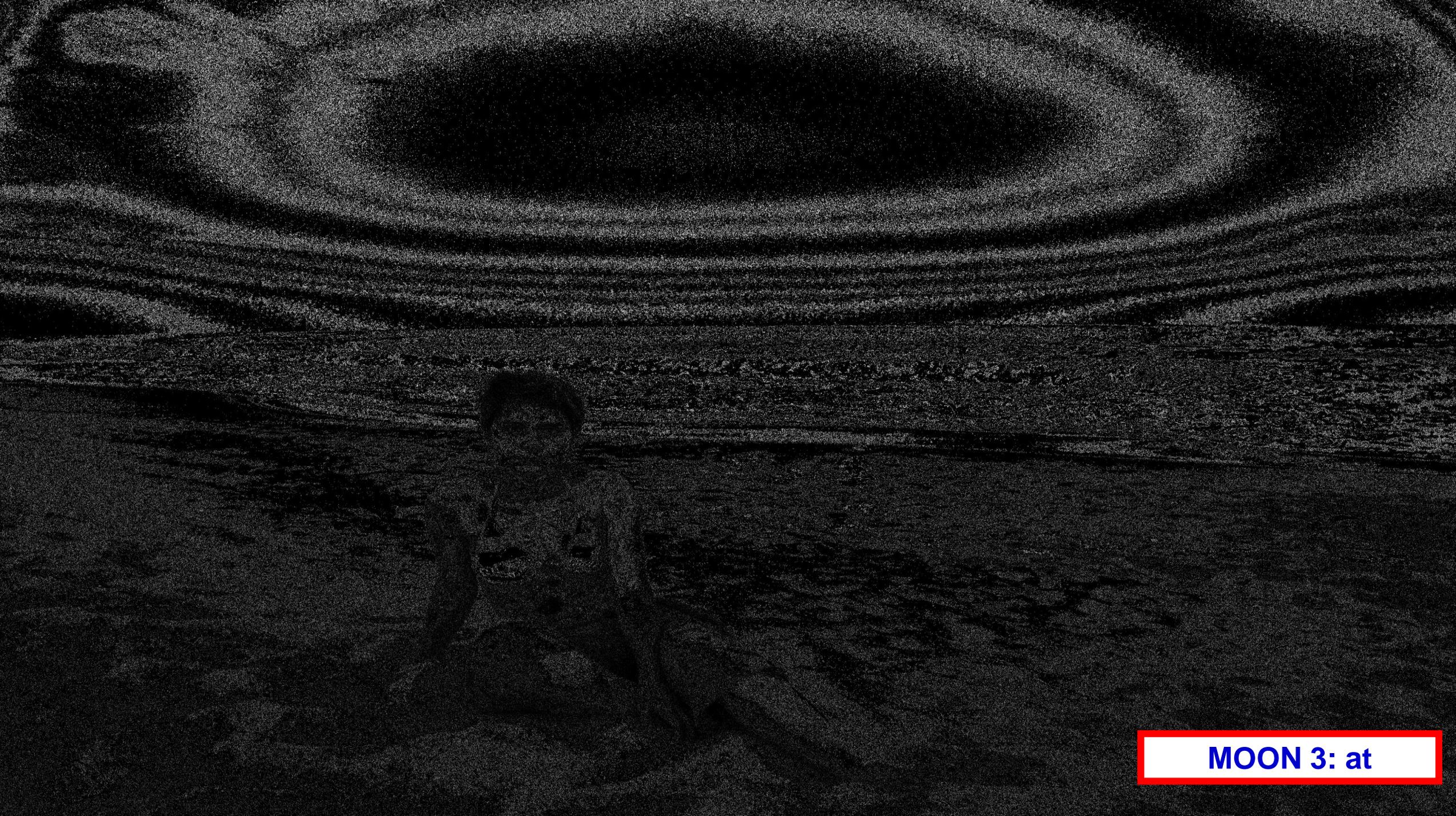


**MOON 9: at**

**MOON 9: at**



**MOON 3: at**



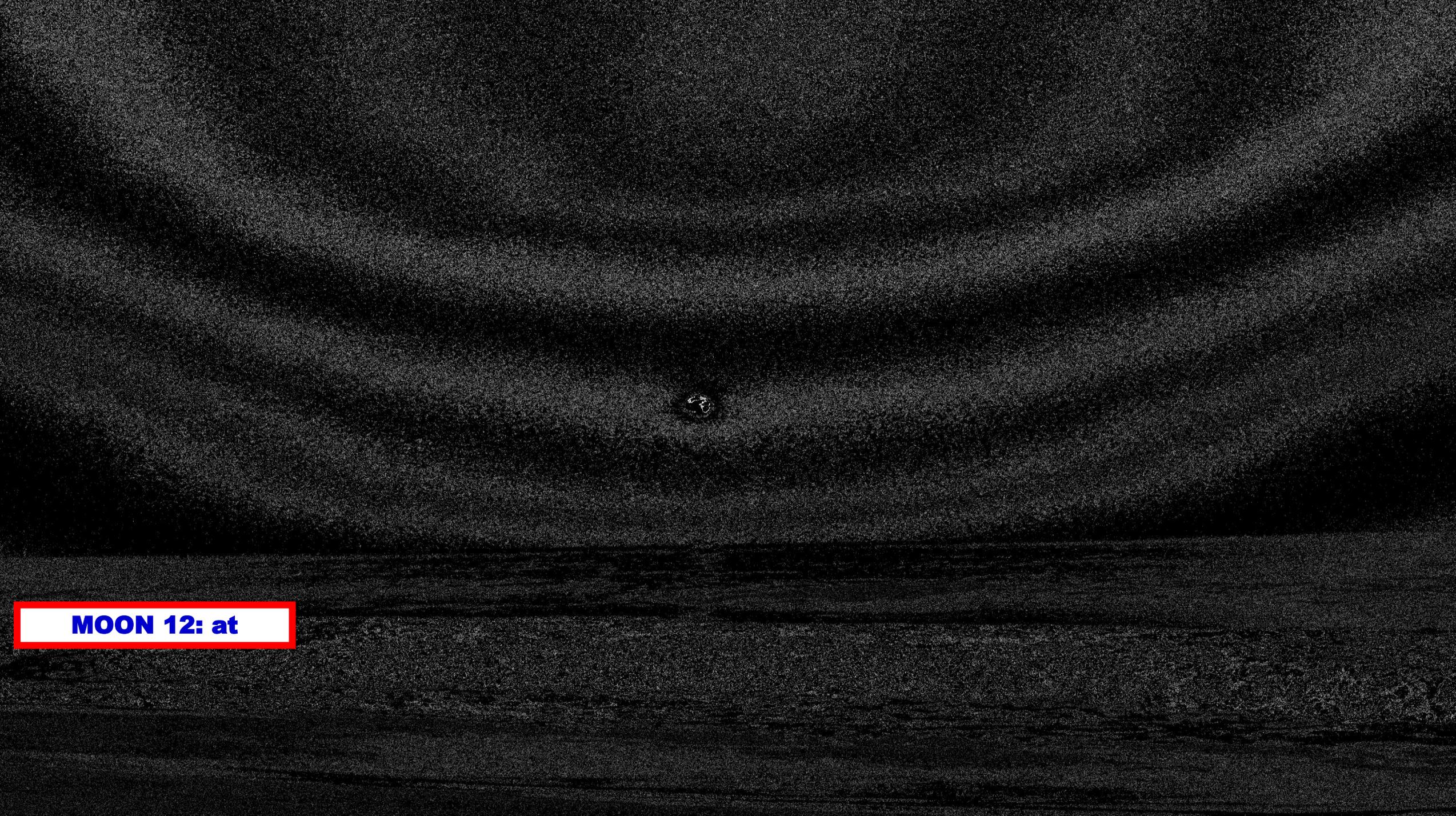
**MOON 3: at**



**MOON 3: at**



**MOON 12: at**

The image shows a dark, grainy, and somewhat blurry view of a celestial body, likely the Moon, against a black background. A small, bright, circular spot is visible near the center of the frame. The overall texture is noisy and high-contrast.

**MOON 12: at**



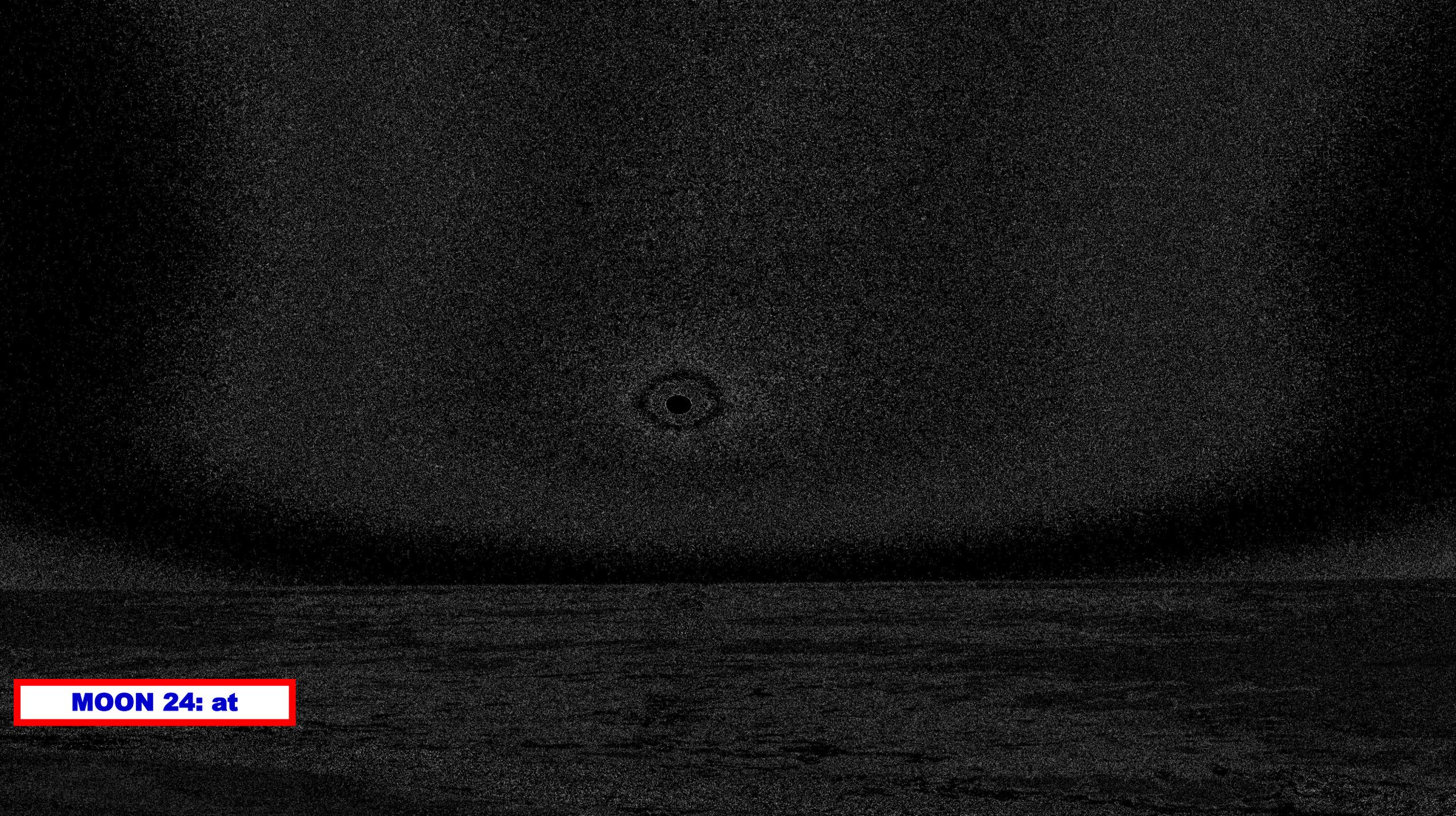
**MOON 16: at**



**MOON 16: at**



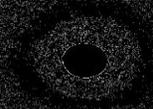
**MOON 24: at**

The image shows a dark, grainy celestial body, likely the Moon, with a small, bright spot in the center. The background is black, and the foreground is a dark, textured surface. A red-bordered box in the bottom left corner contains the text "MOON 24: at".

**MOON 24: at**



**MOON 27: at**



**MOON 27: at**



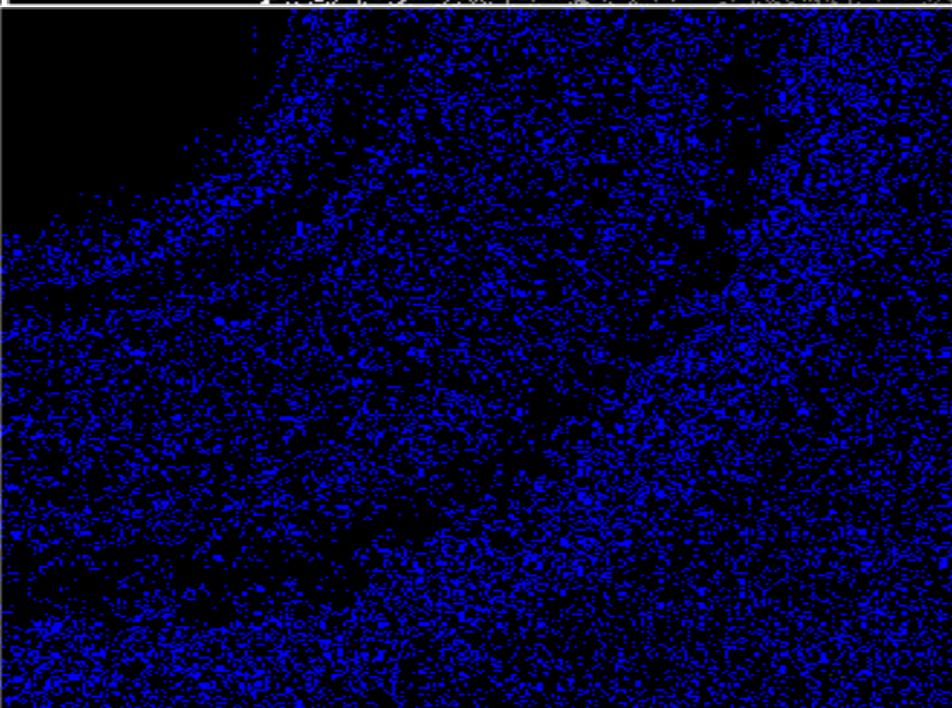
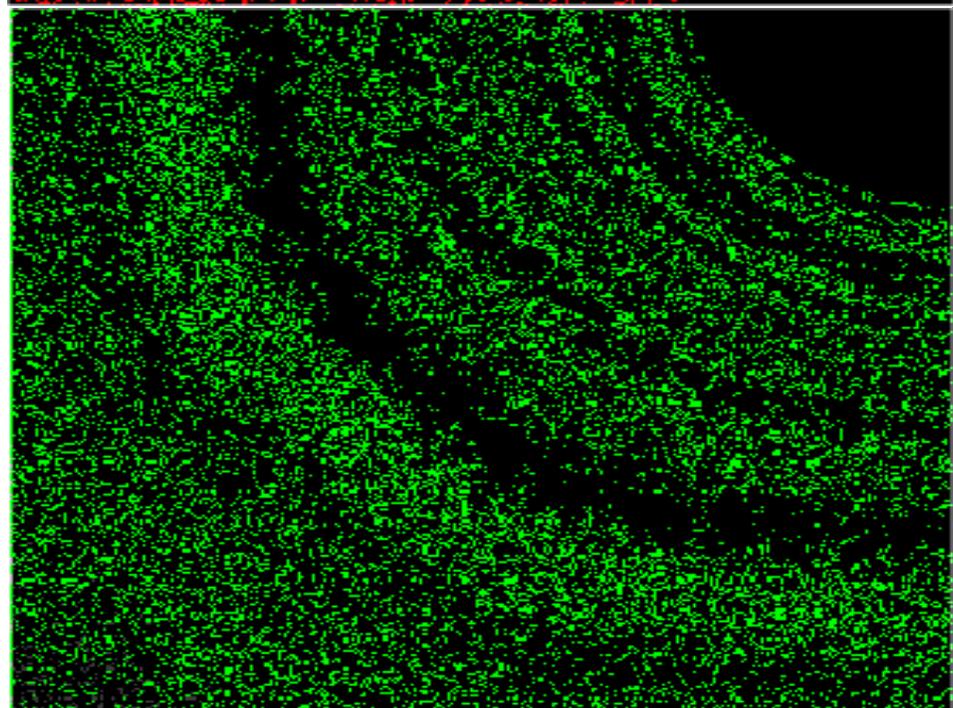
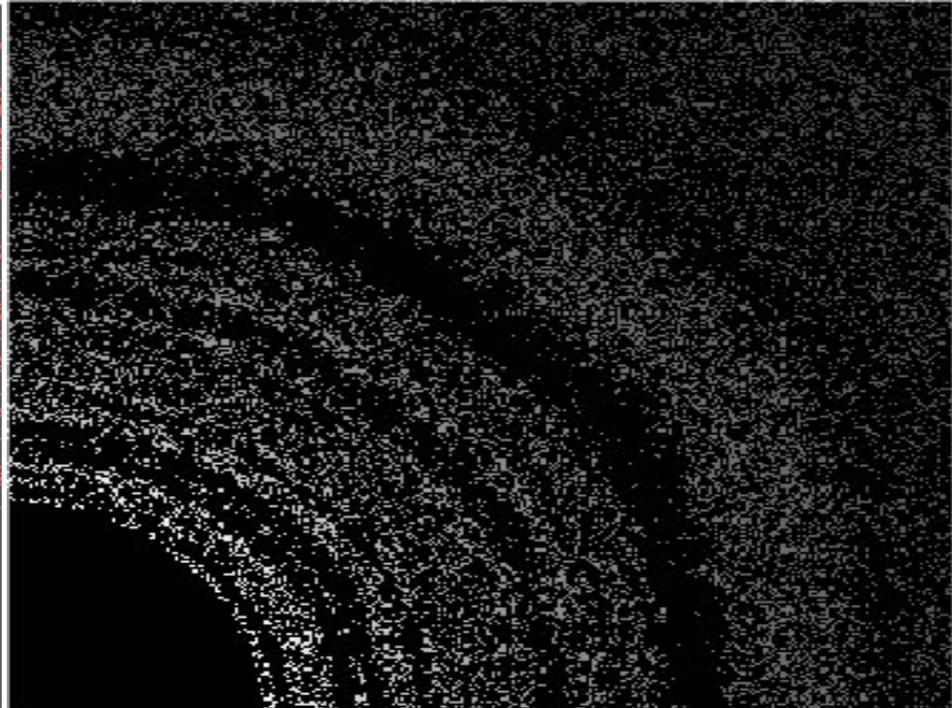
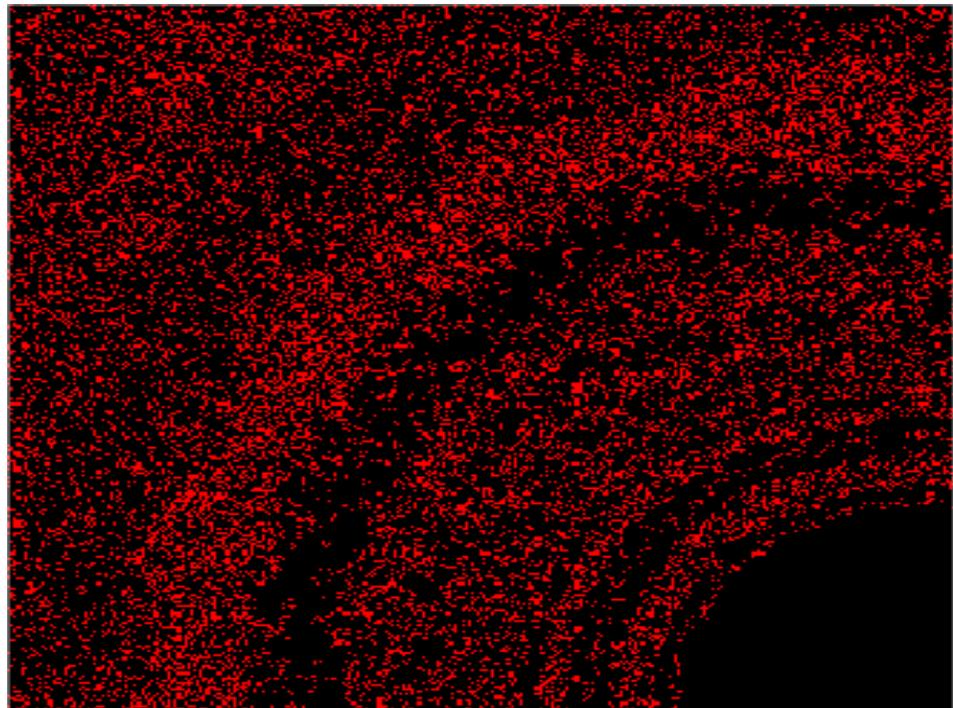
**MOON 39: at**

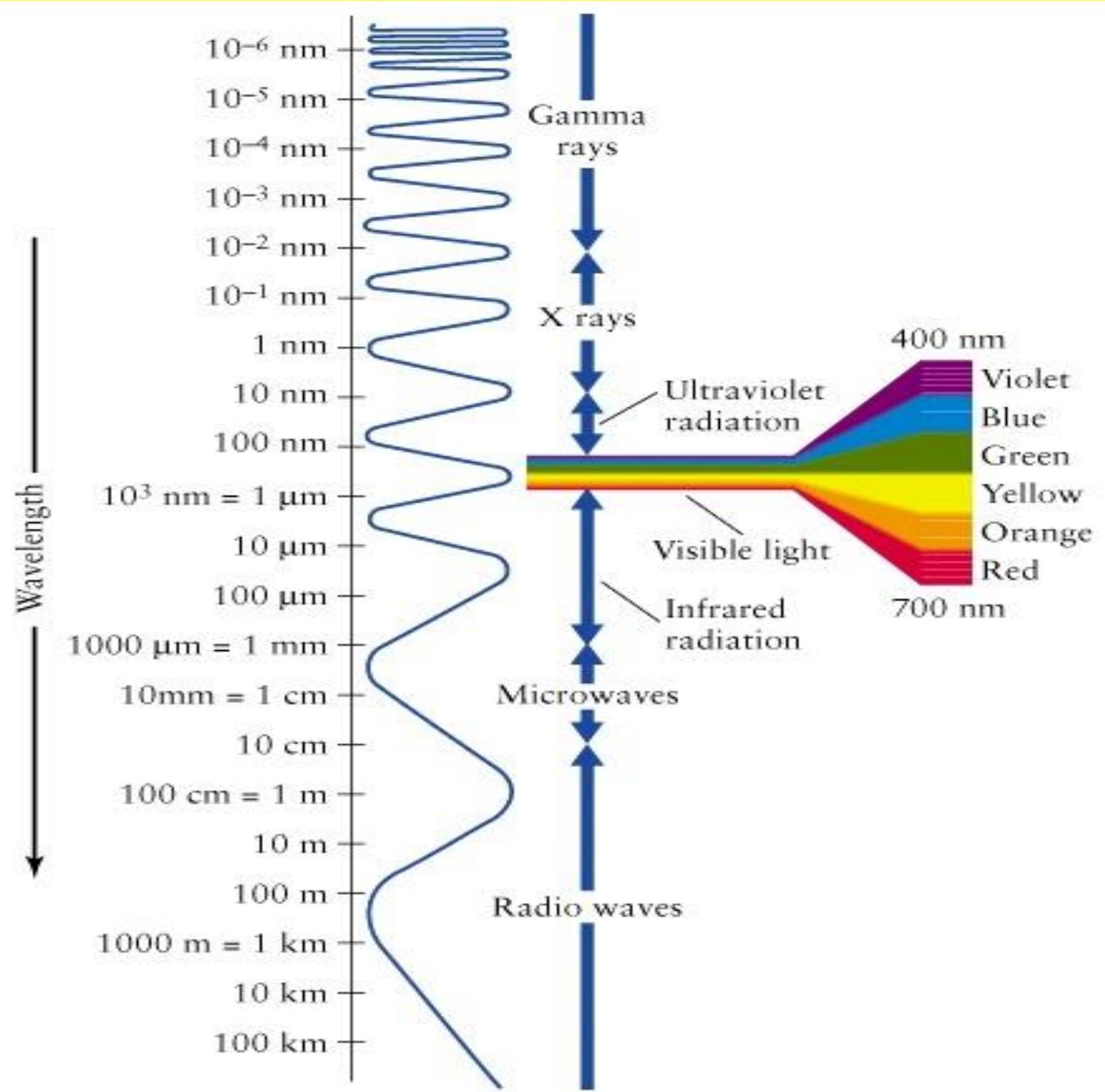
**MOON 39: at**



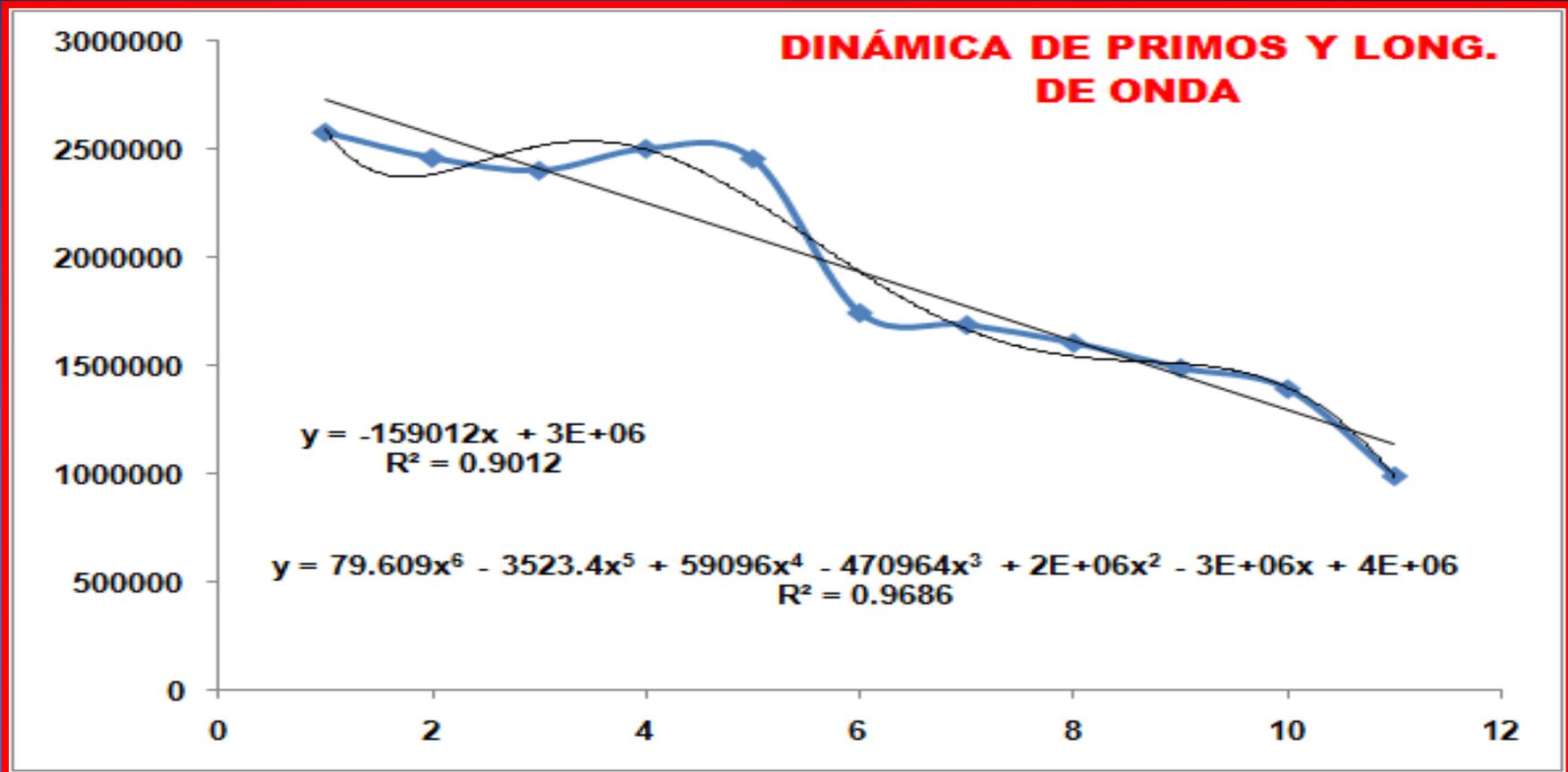
**MOON 69: at**

**MOON 69: at**

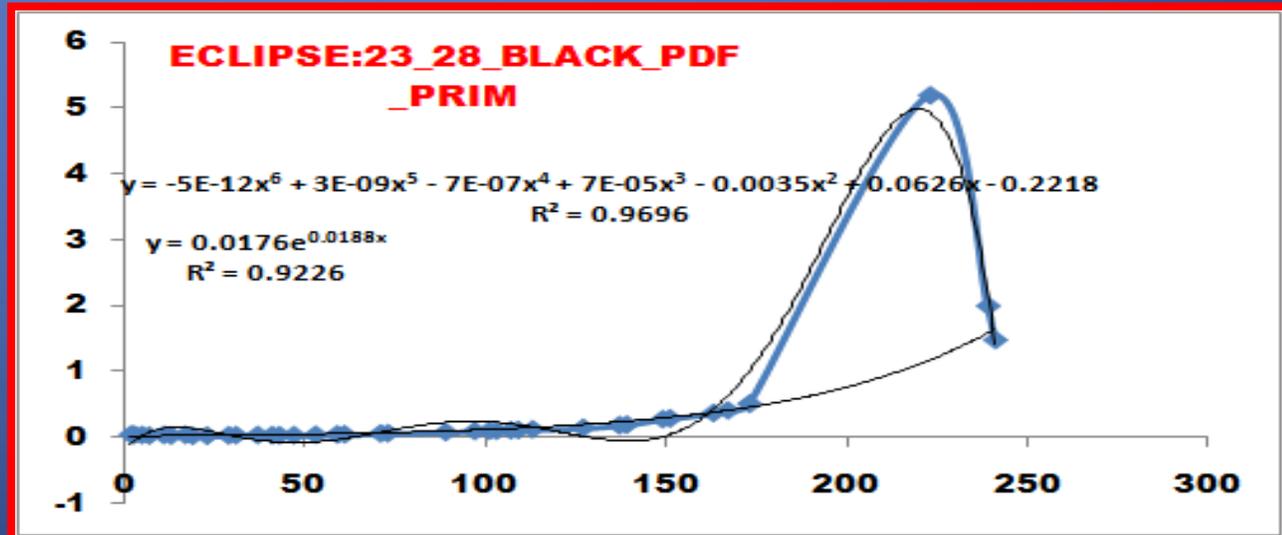




**Tomografía Sísmica y  
Micro-Tomografía de Rayos X**

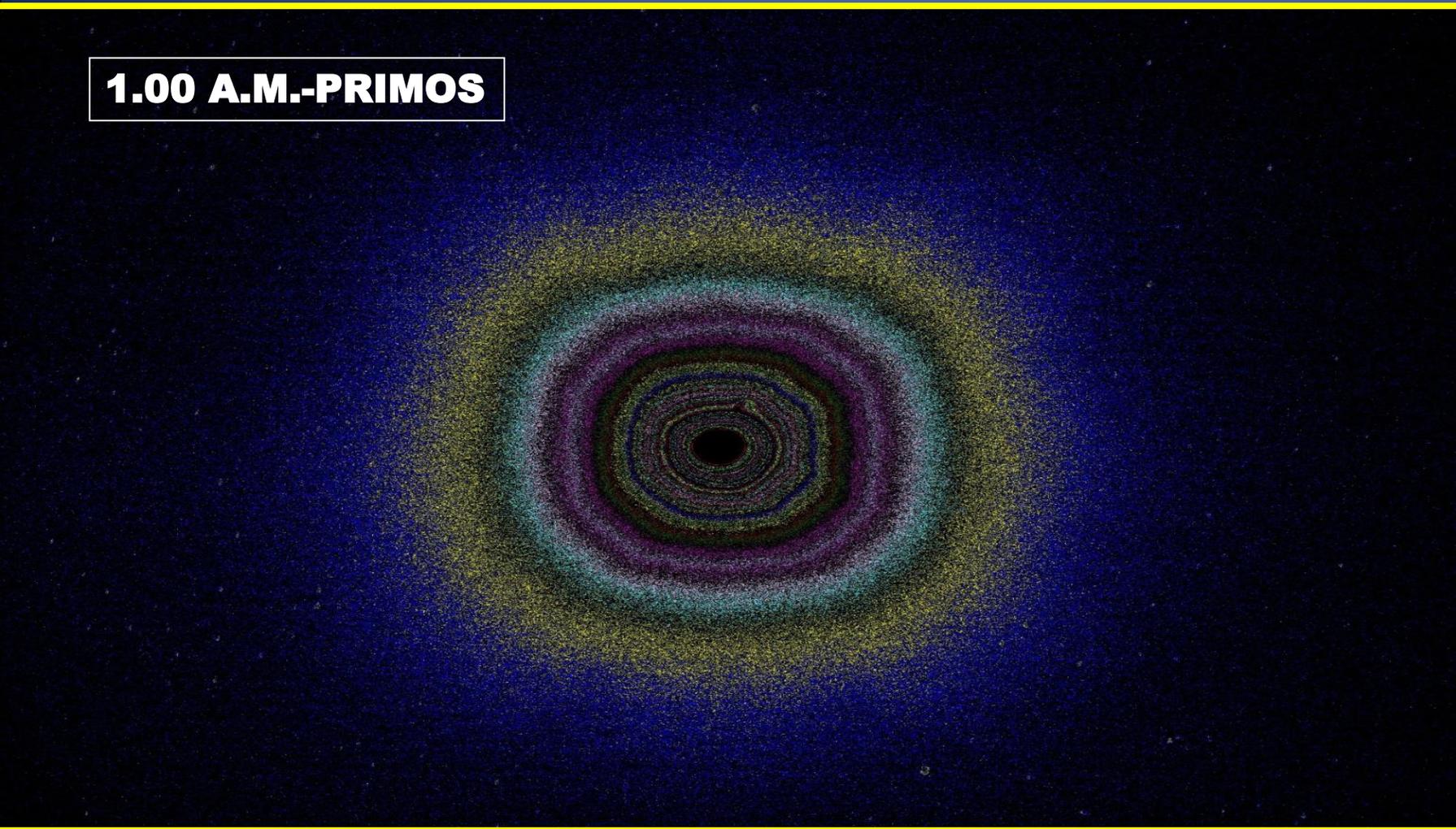


<b>ROJO</b>	<b>1</b>	<b>2576837</b>
<b>VERDE</b>	<b>2</b>	<b>2459538</b>
<b>AZUL</b>	<b>3</b>	<b>2400939</b>
<b>GRIS</b>	<b>4</b>	<b>2501824</b>
<b>LIGHT</b>	<b>5</b>	<b>2456013</b>
<b>SAT</b>	<b>6</b>	<b>1744604</b>
<b>HUE</b>	<b>7</b>	<b>1688560</b>
<b>CYAN</b>	<b>8</b>	<b>1605220</b>
<b>MAGENTA</b>	<b>9</b>	<b>1489218</b>
<b>YELLOW</b>	<b>10</b>	<b>1393004</b>
<b>NEGRO</b>	<b>11</b>	<b>990965</b>



**ECLIPSE-DEC.21-2010-1.00 A.M.**

**1.00 A.M.-PRIMOS**



4000000

$$y = 611840x^6 - 9E+07x^5 + 6E+09x^4 - 2E+11x^3 + 4E+12x^2 - 4E+13x + 2E+14$$

$R^2 = 0.9012$

3500000

### DINÁMICA DEL Nprim CON EL ECLIPSE

3000000

2500000

2000000

1500000

1000000

500000

0

23

23.5

24

24.5

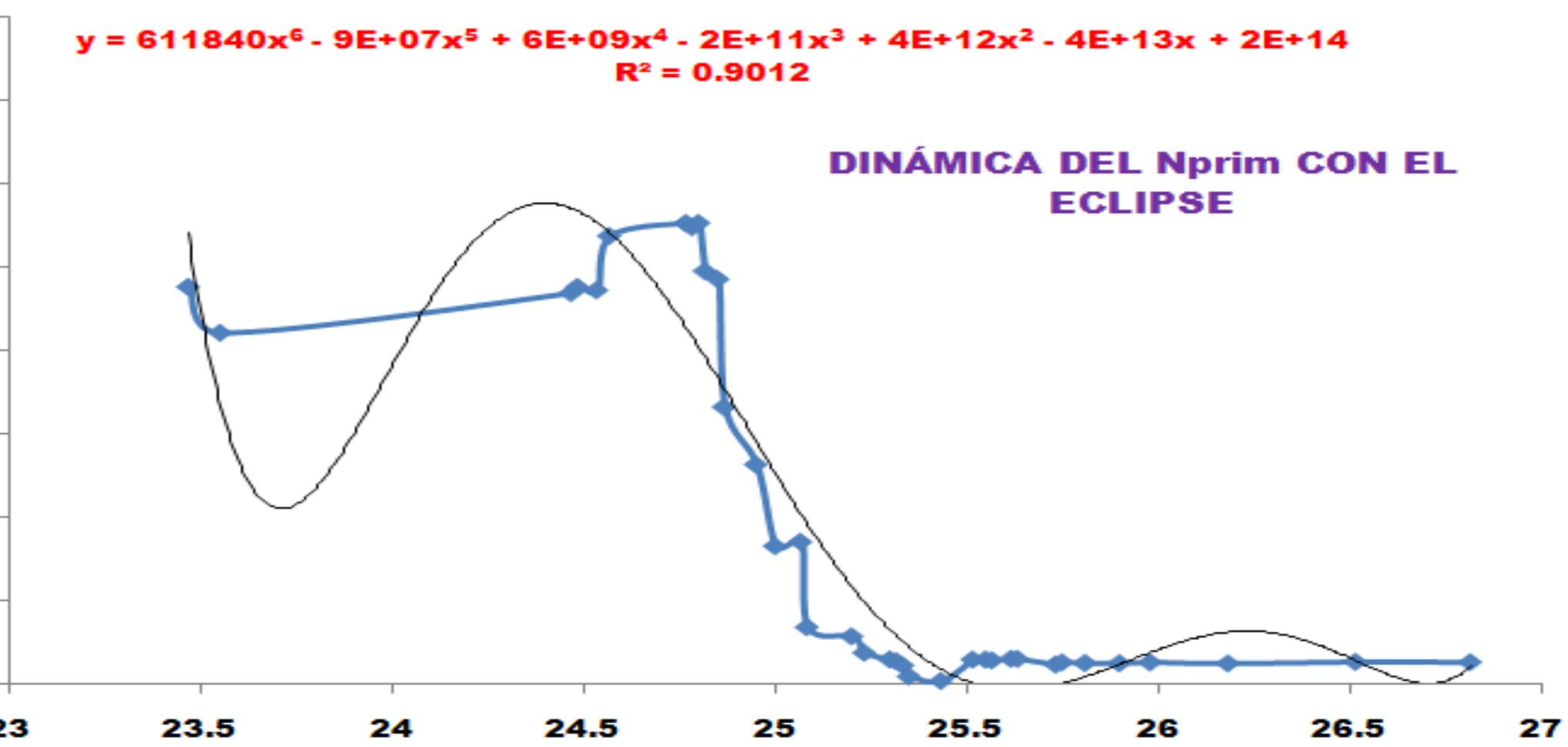
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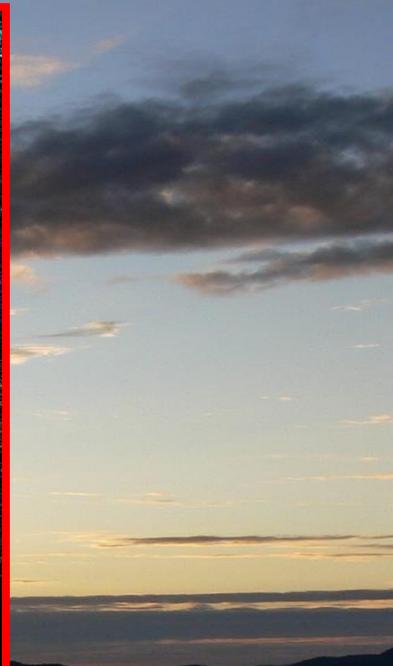
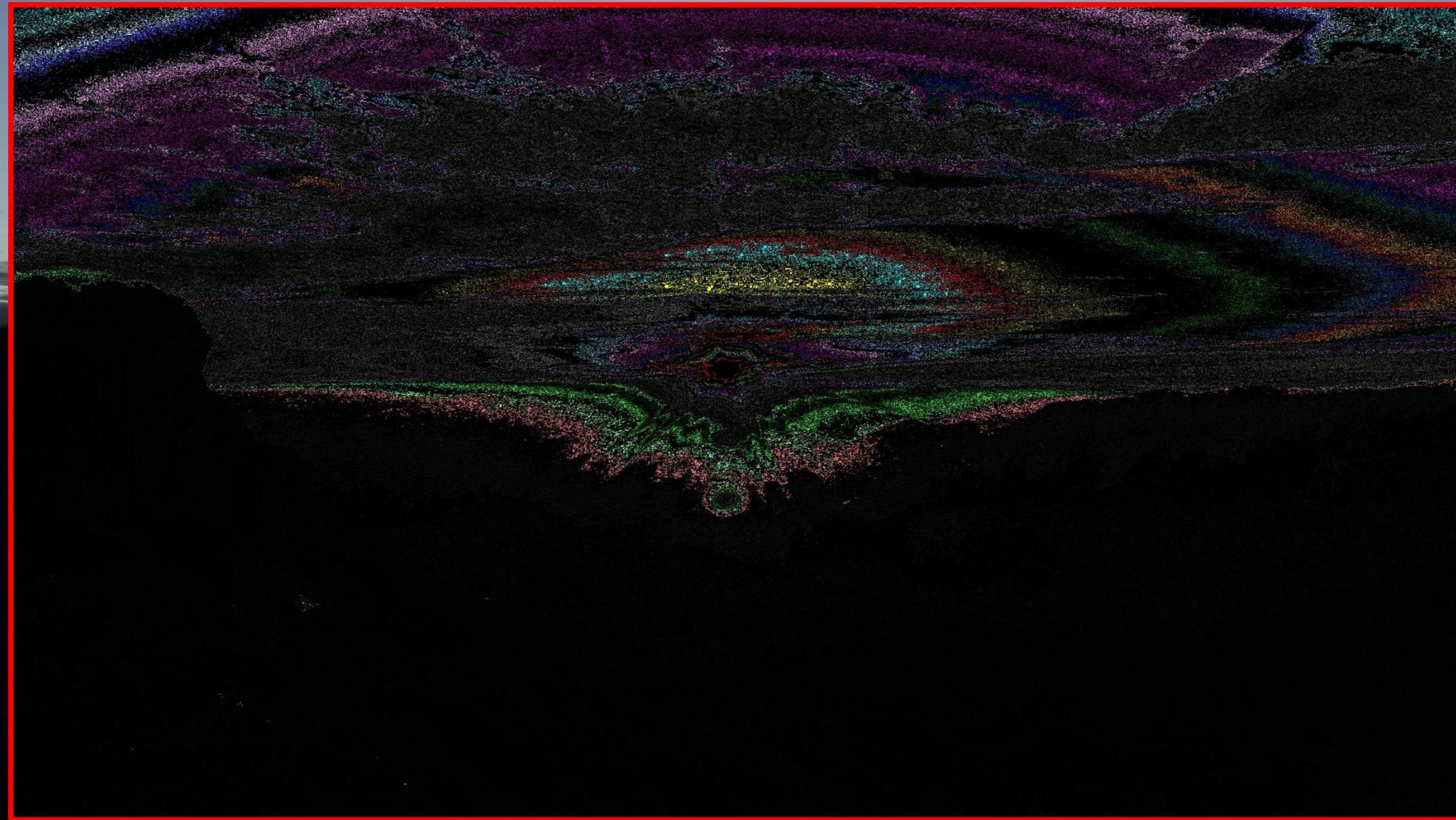
25.5

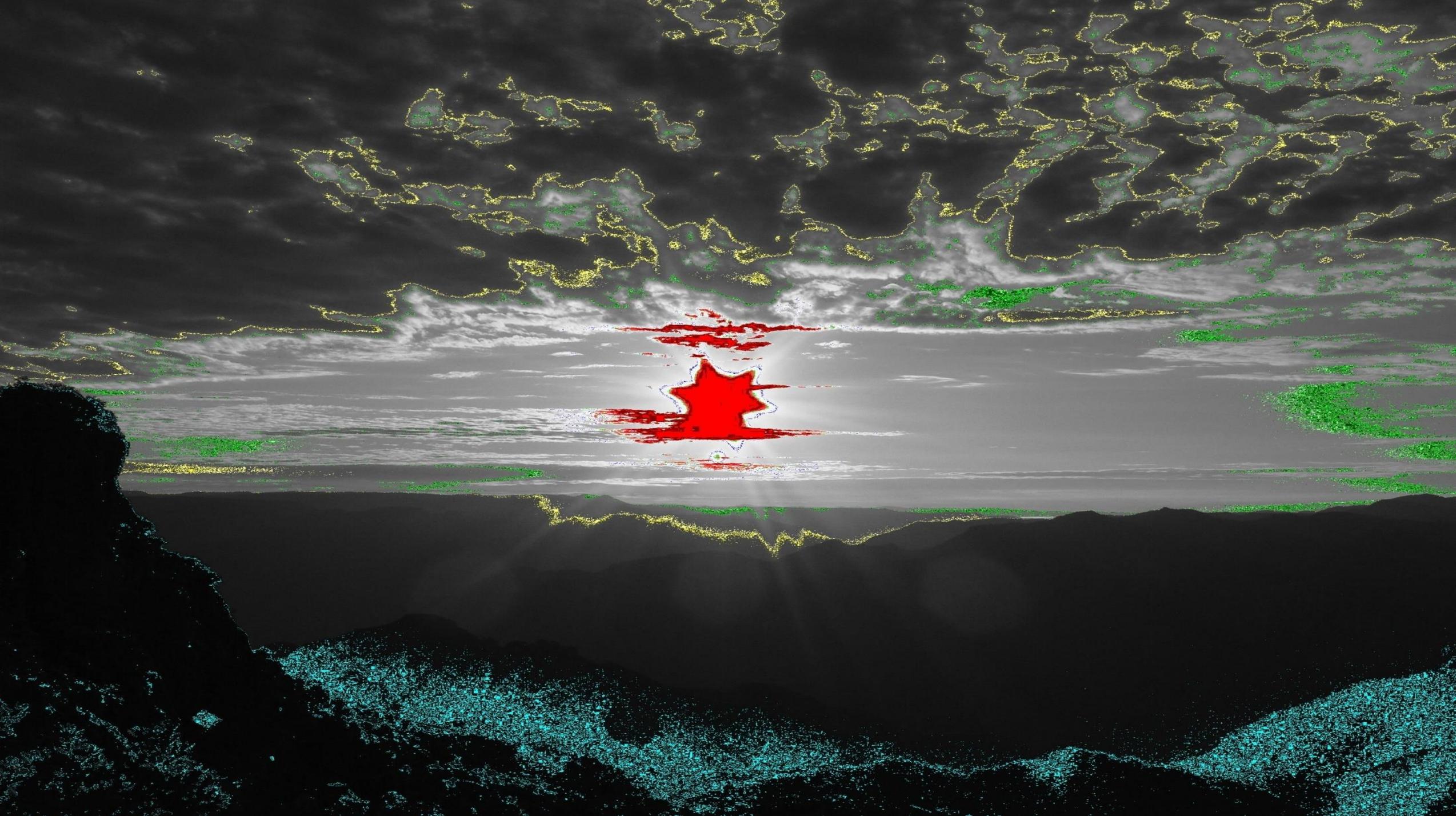
26

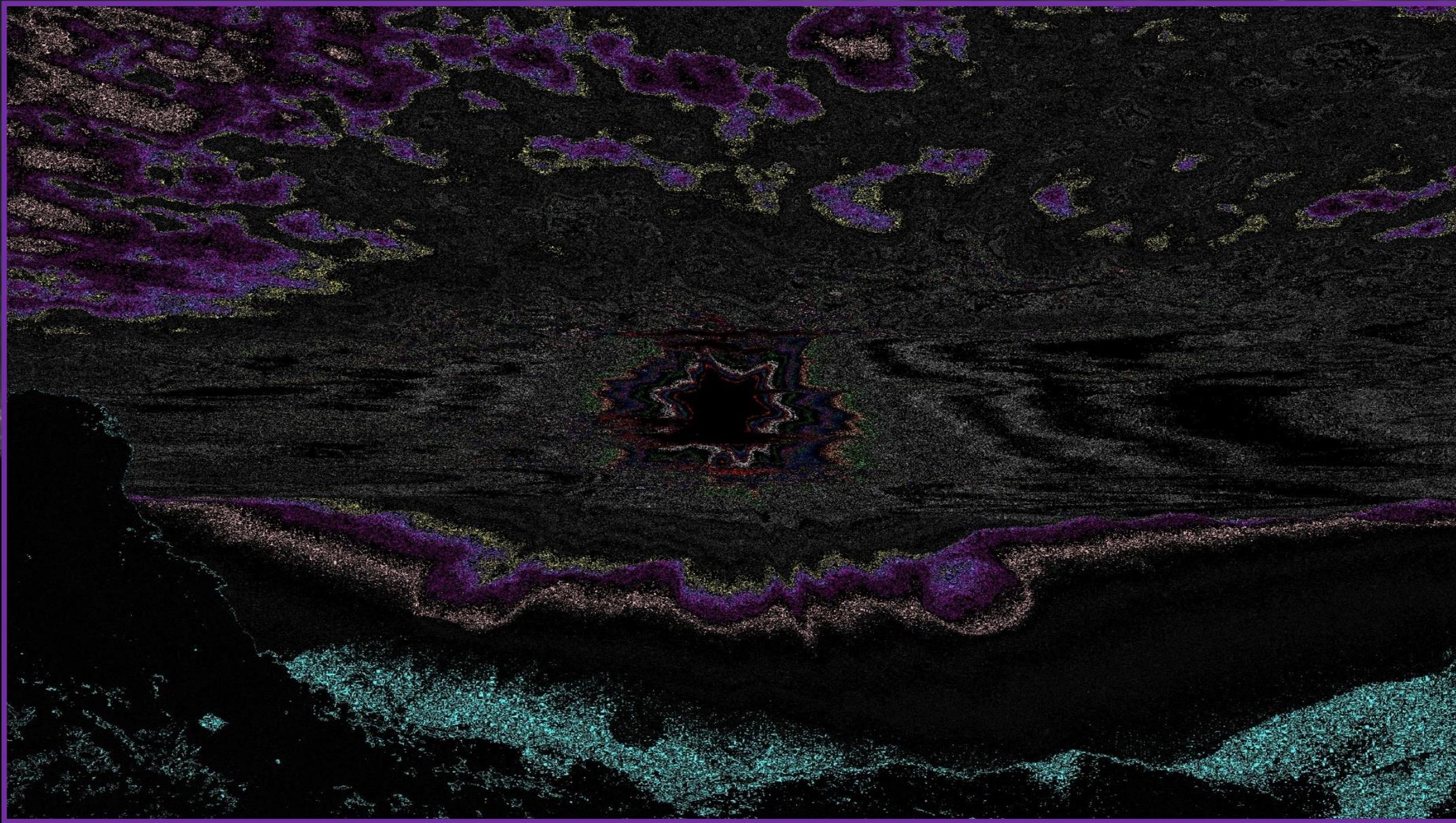
26.5

27





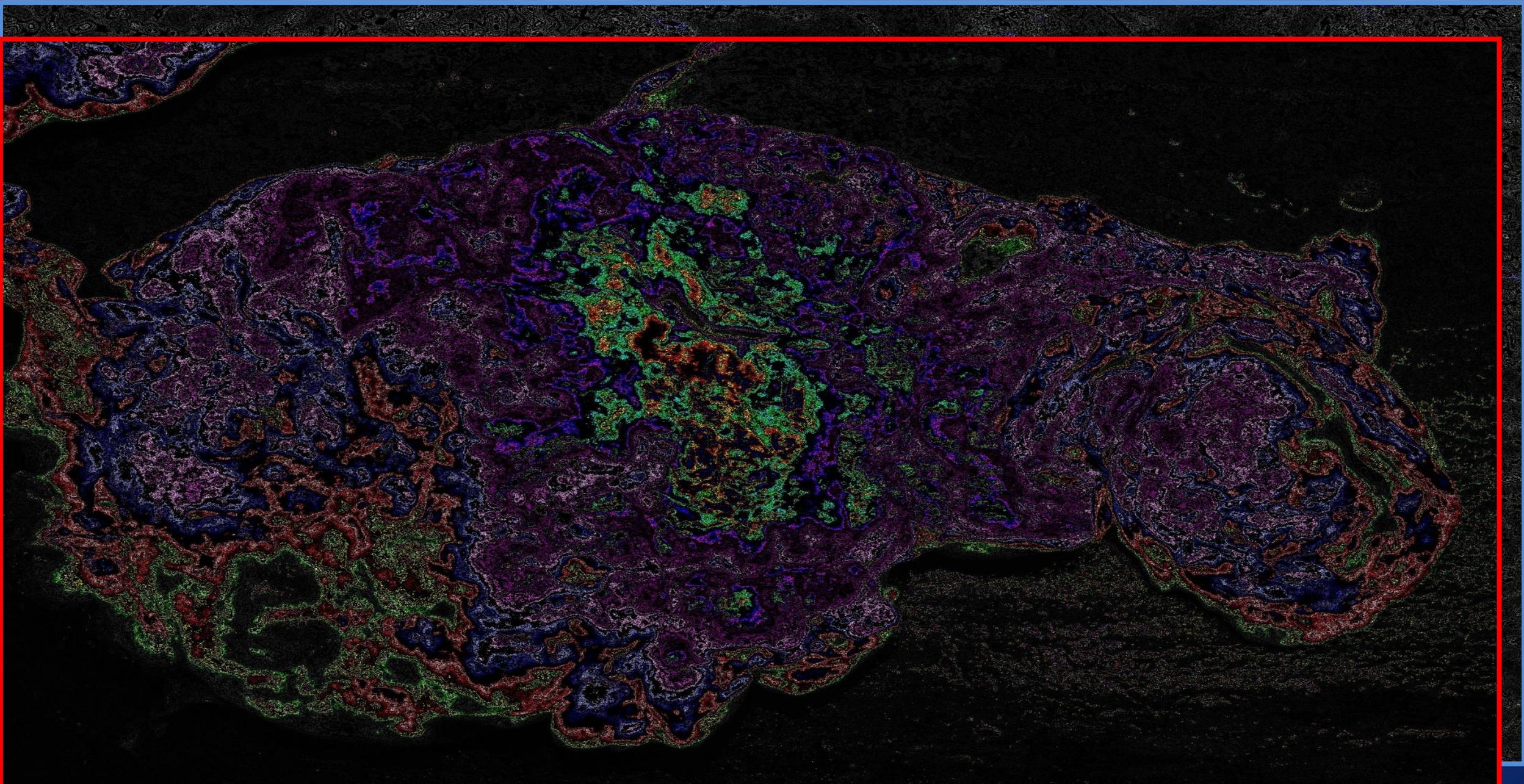


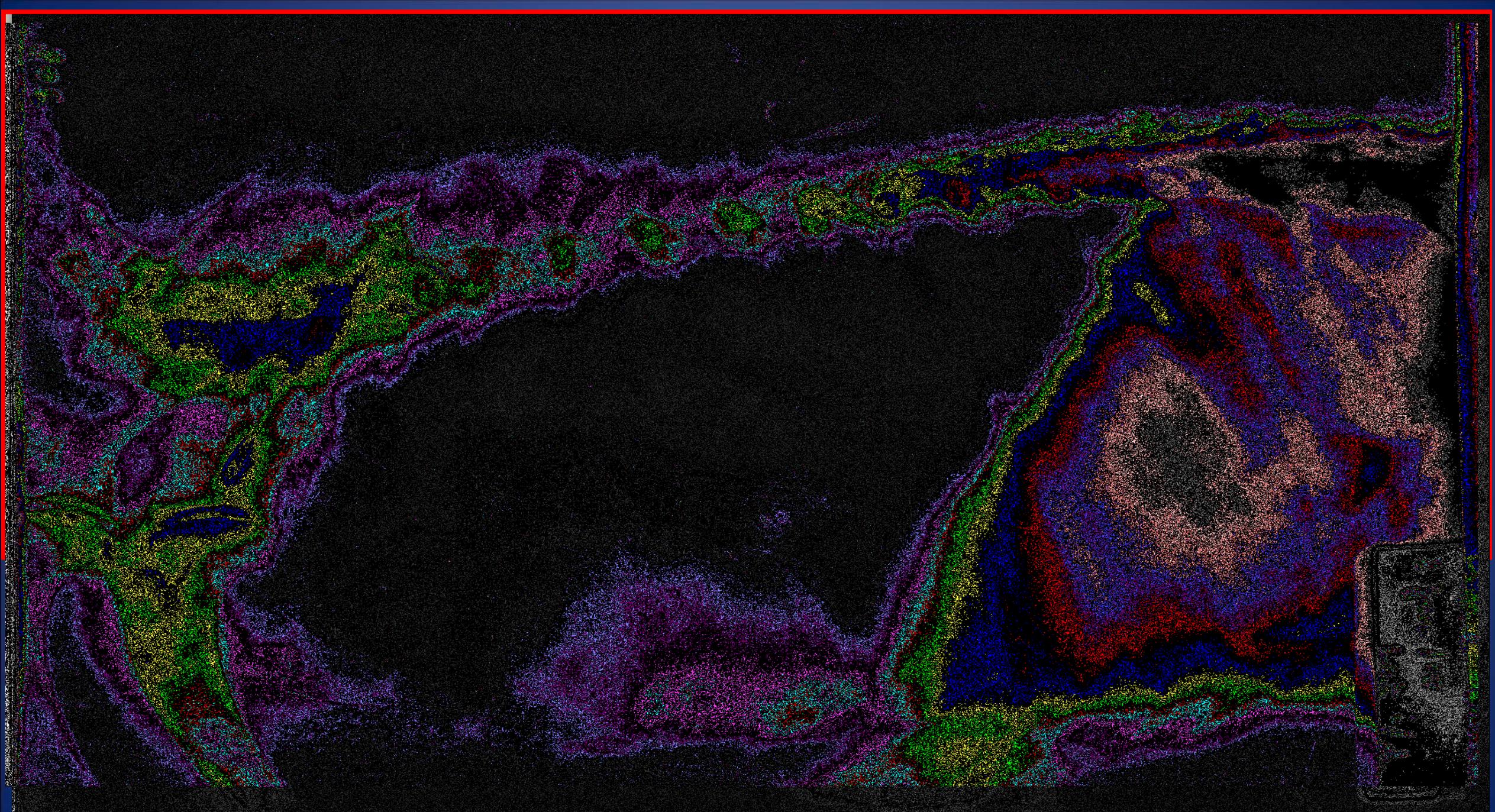


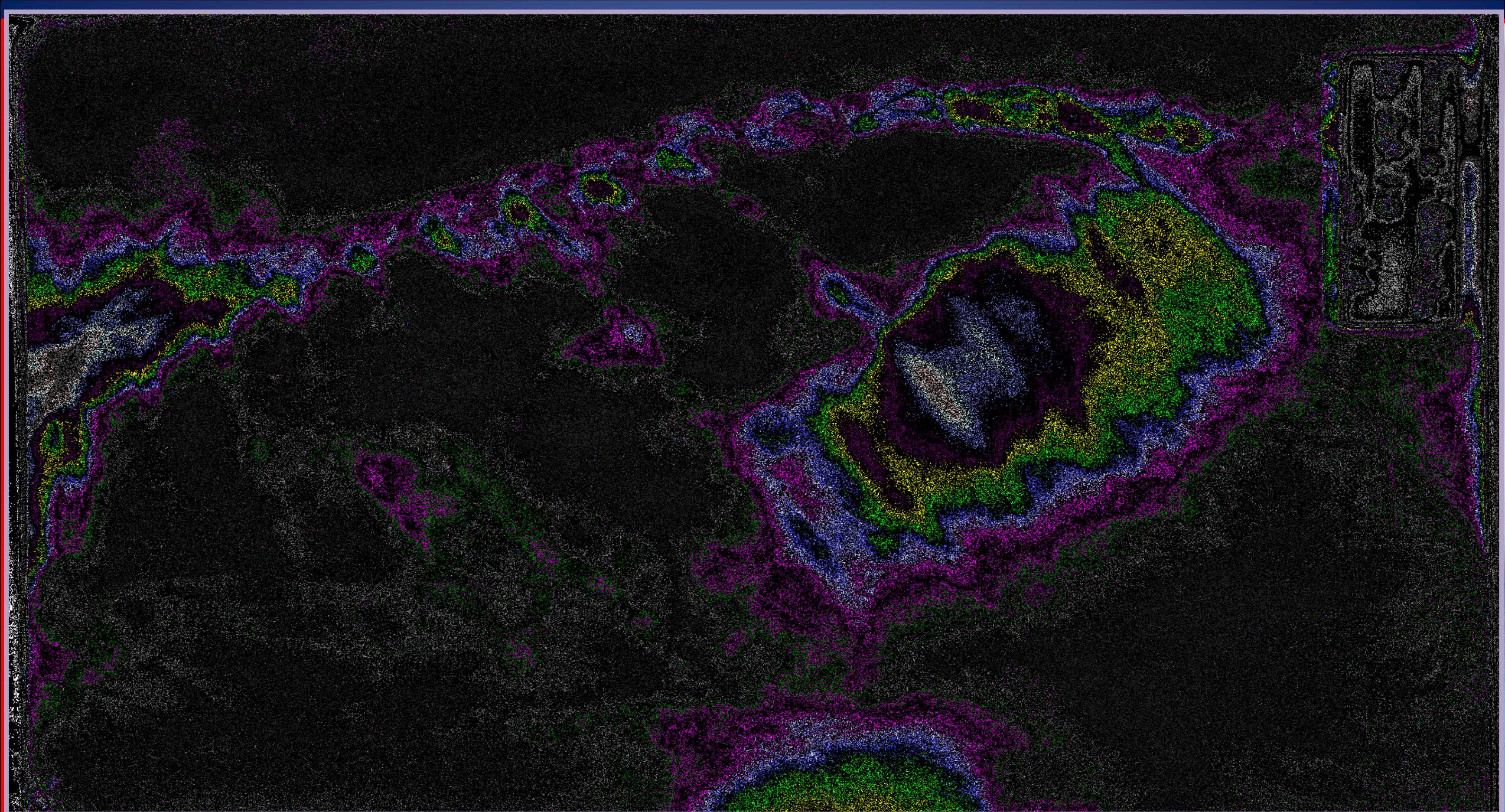
# MY DOG MÍNI AND RIEMANN ZETA FUNCIÓN

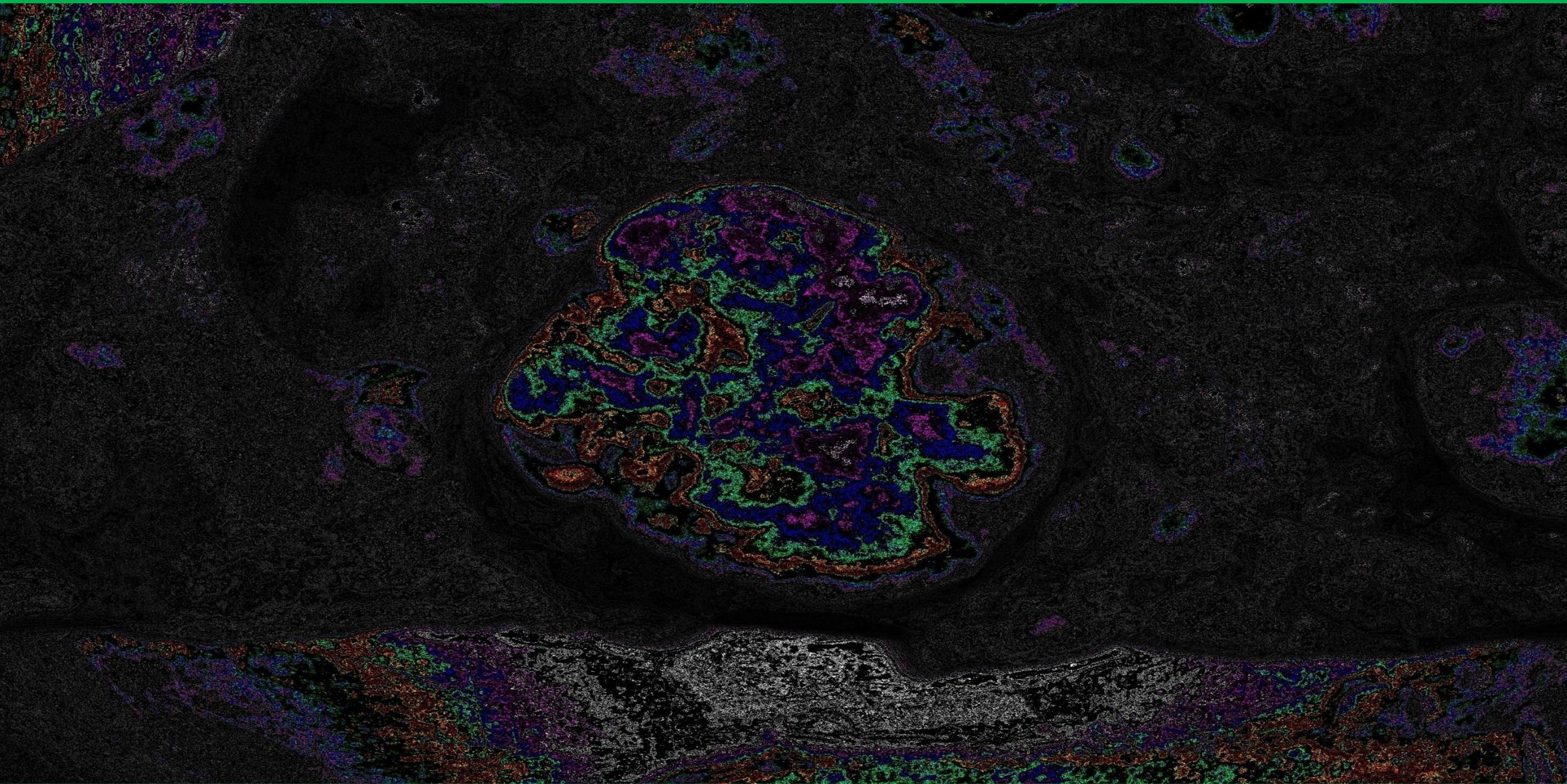




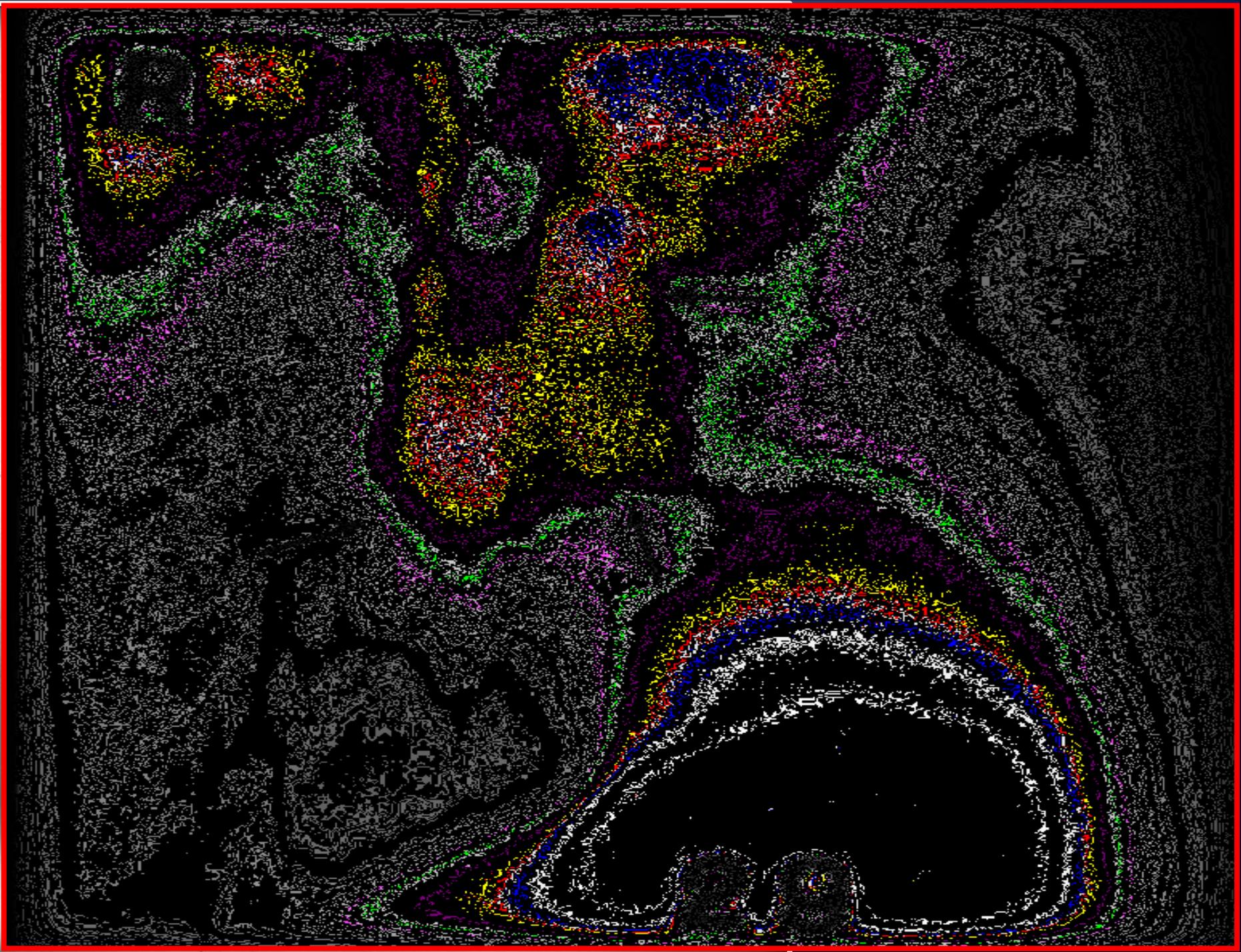




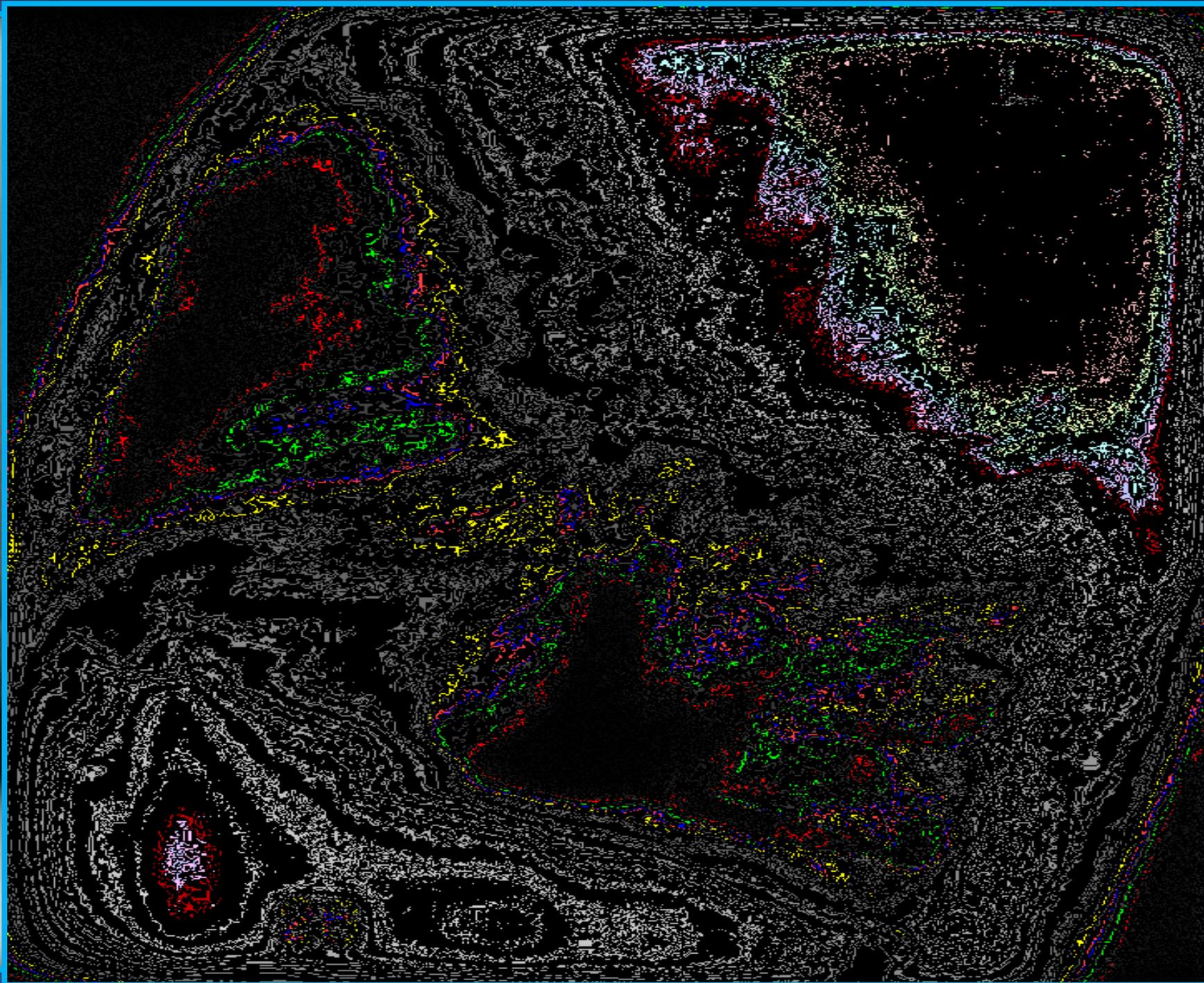


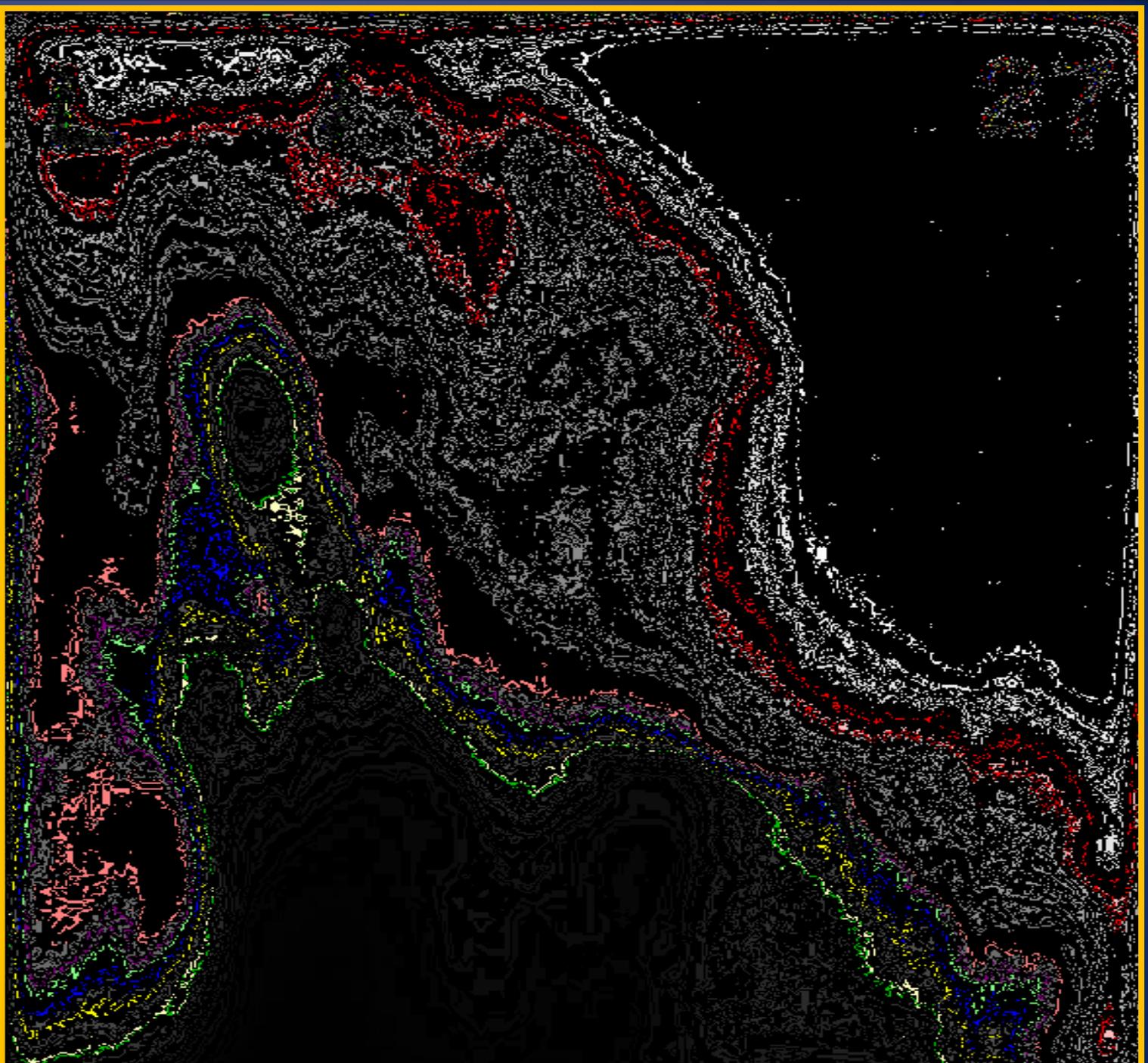


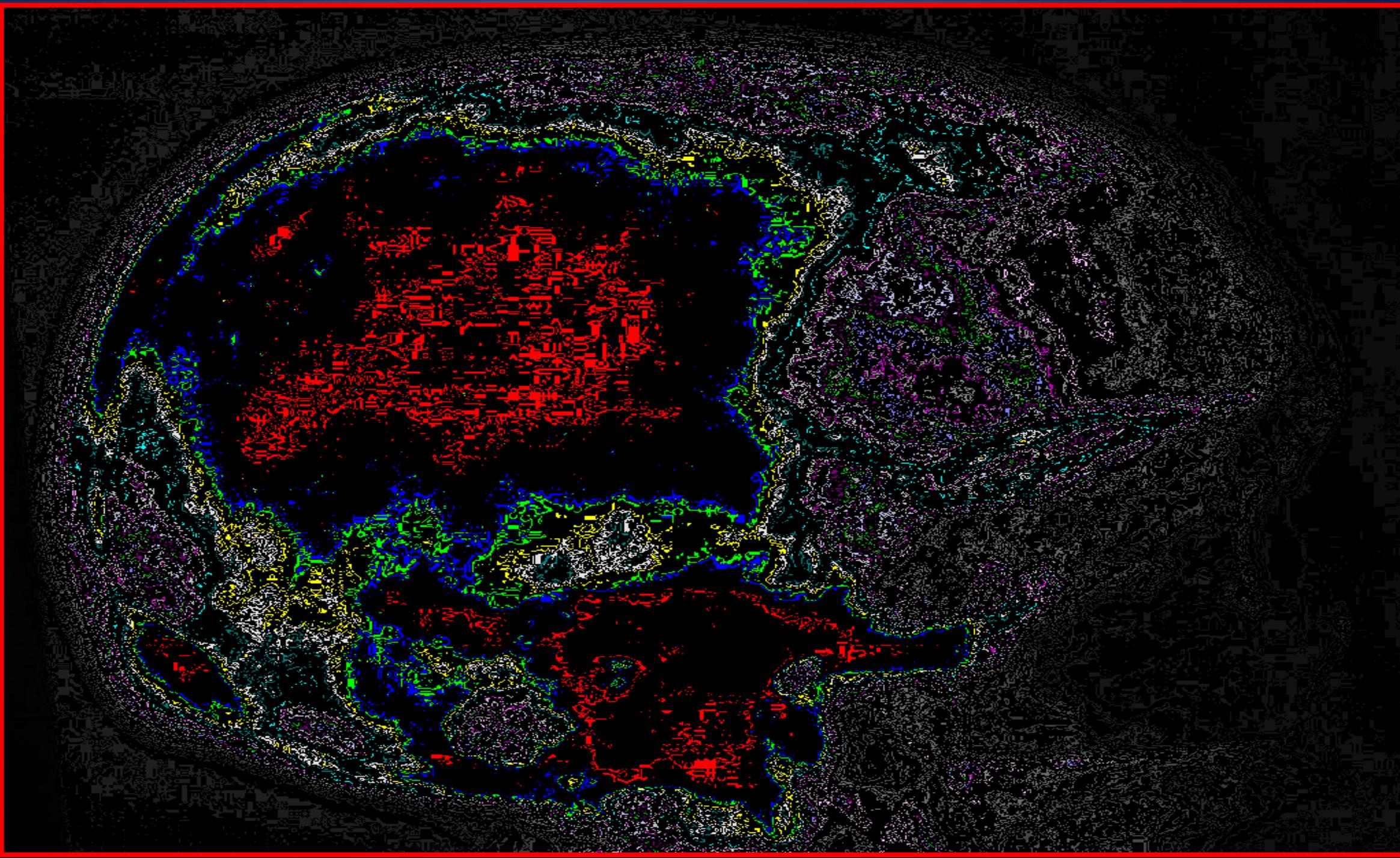
R

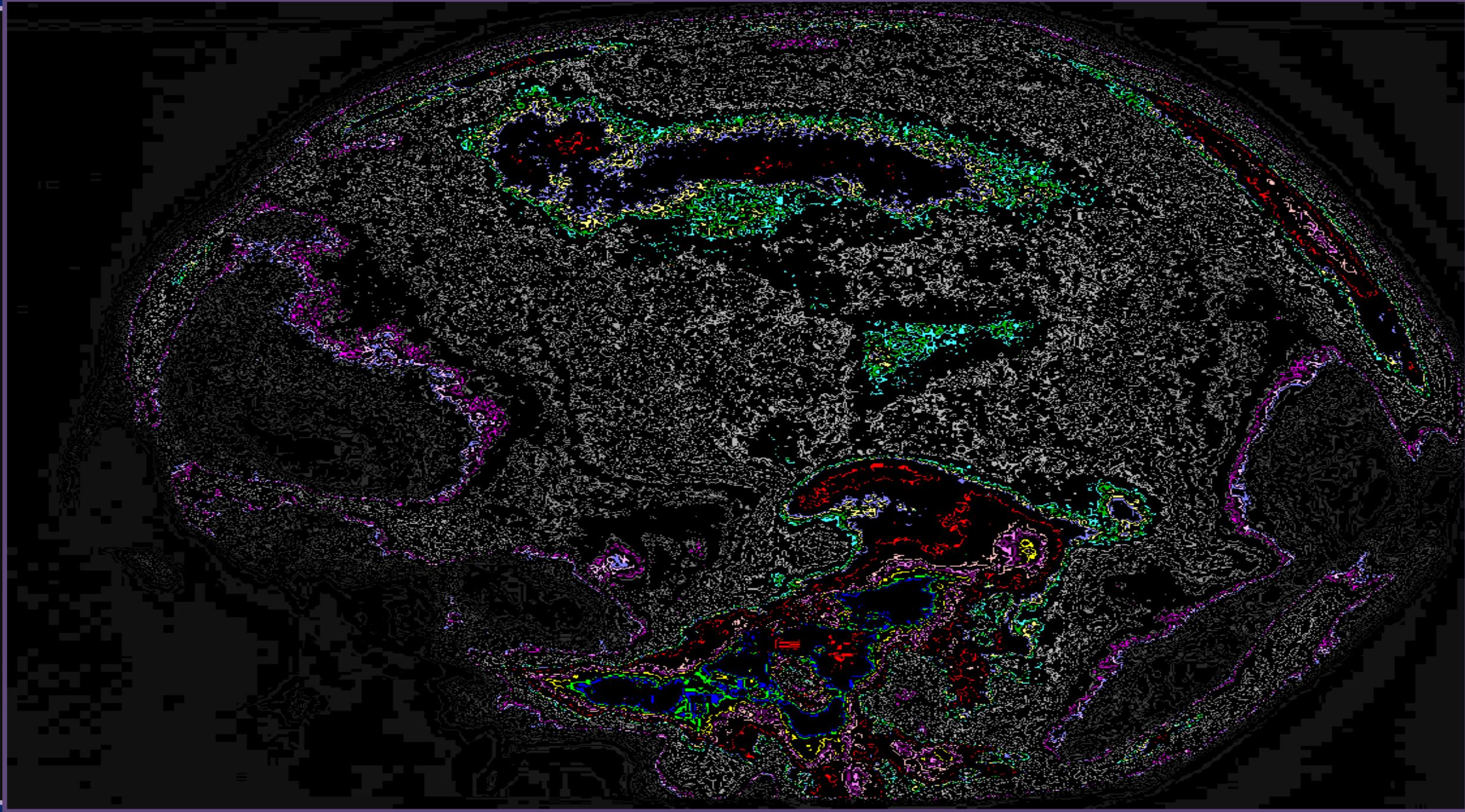


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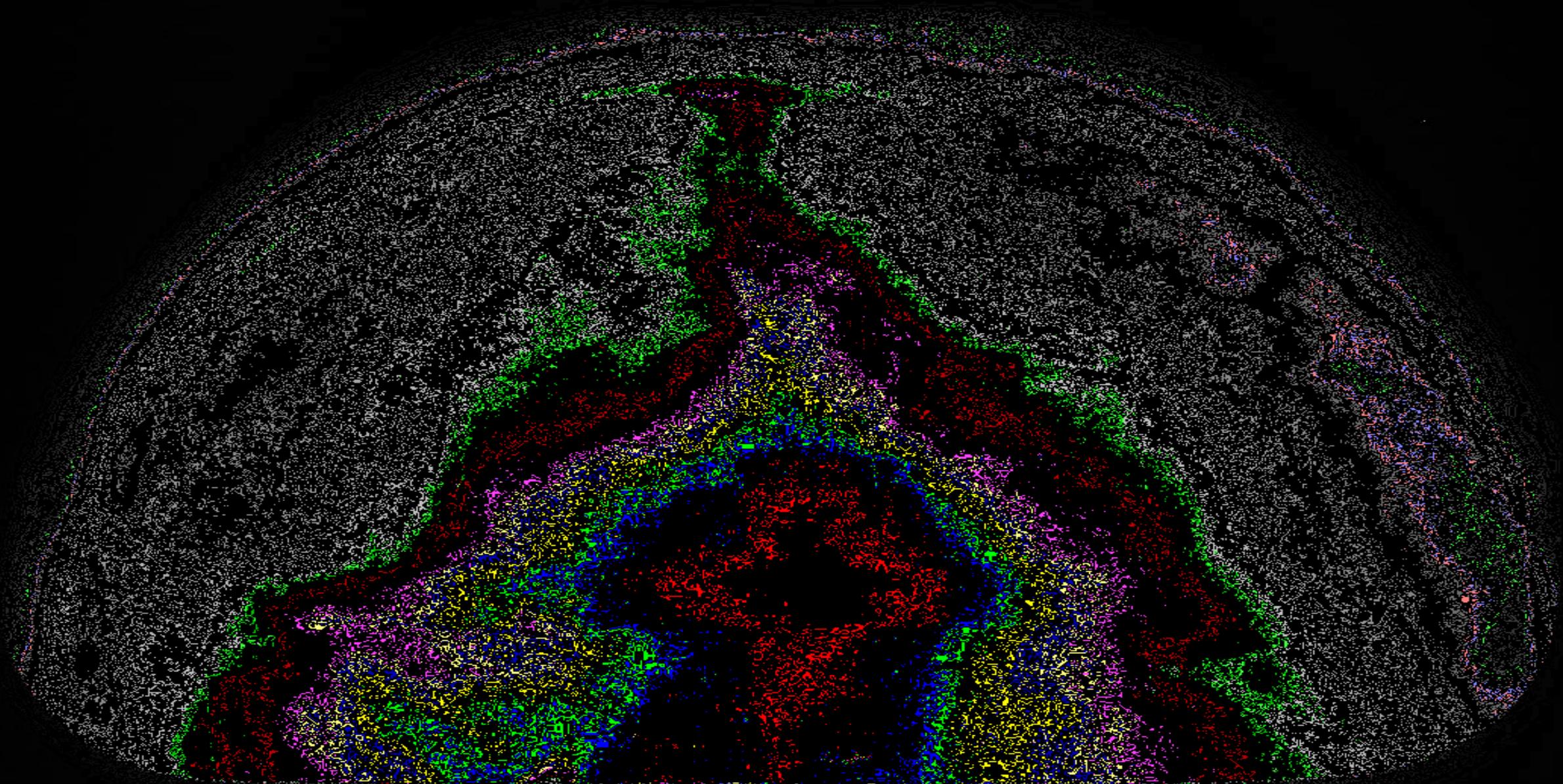


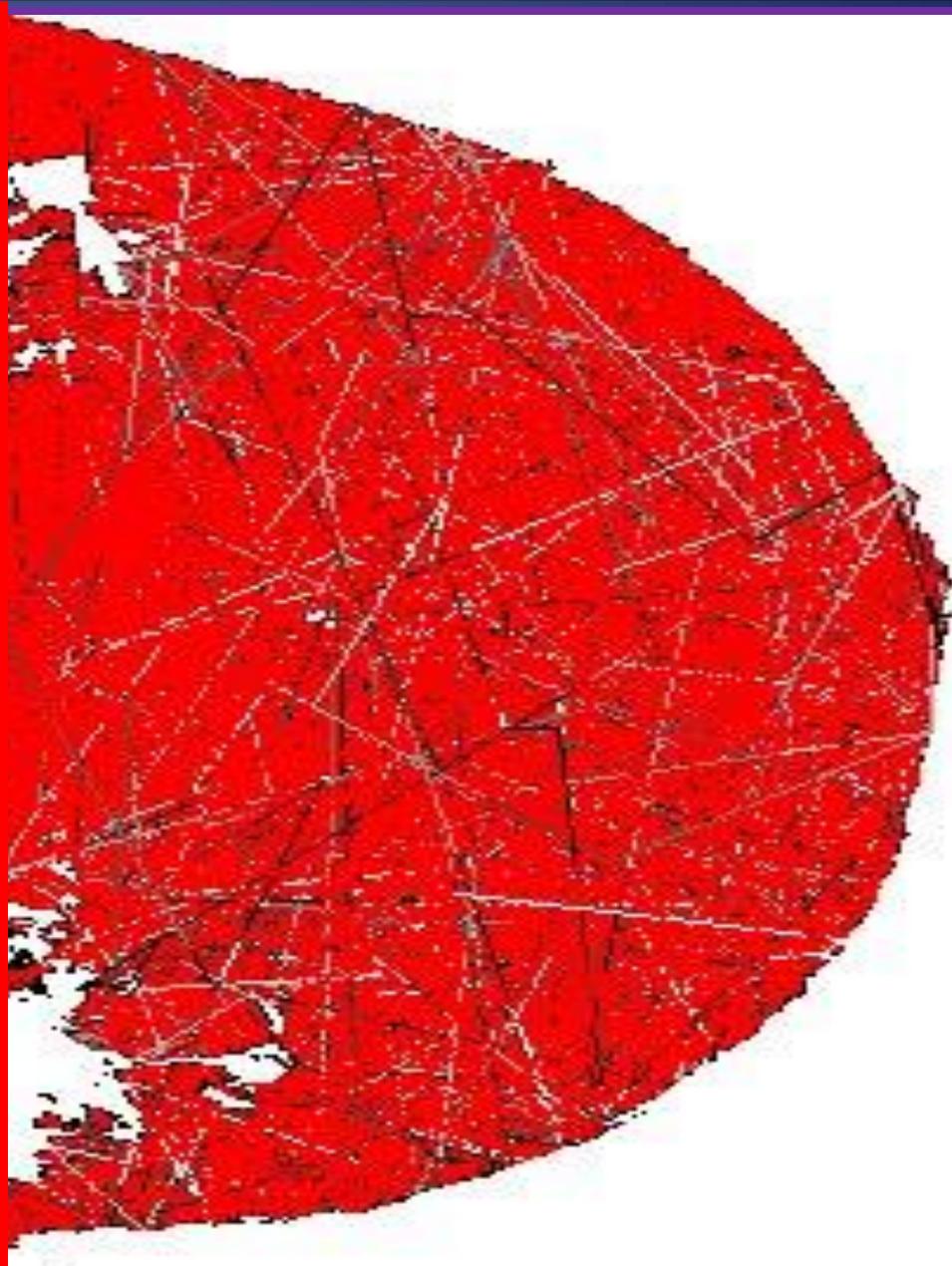
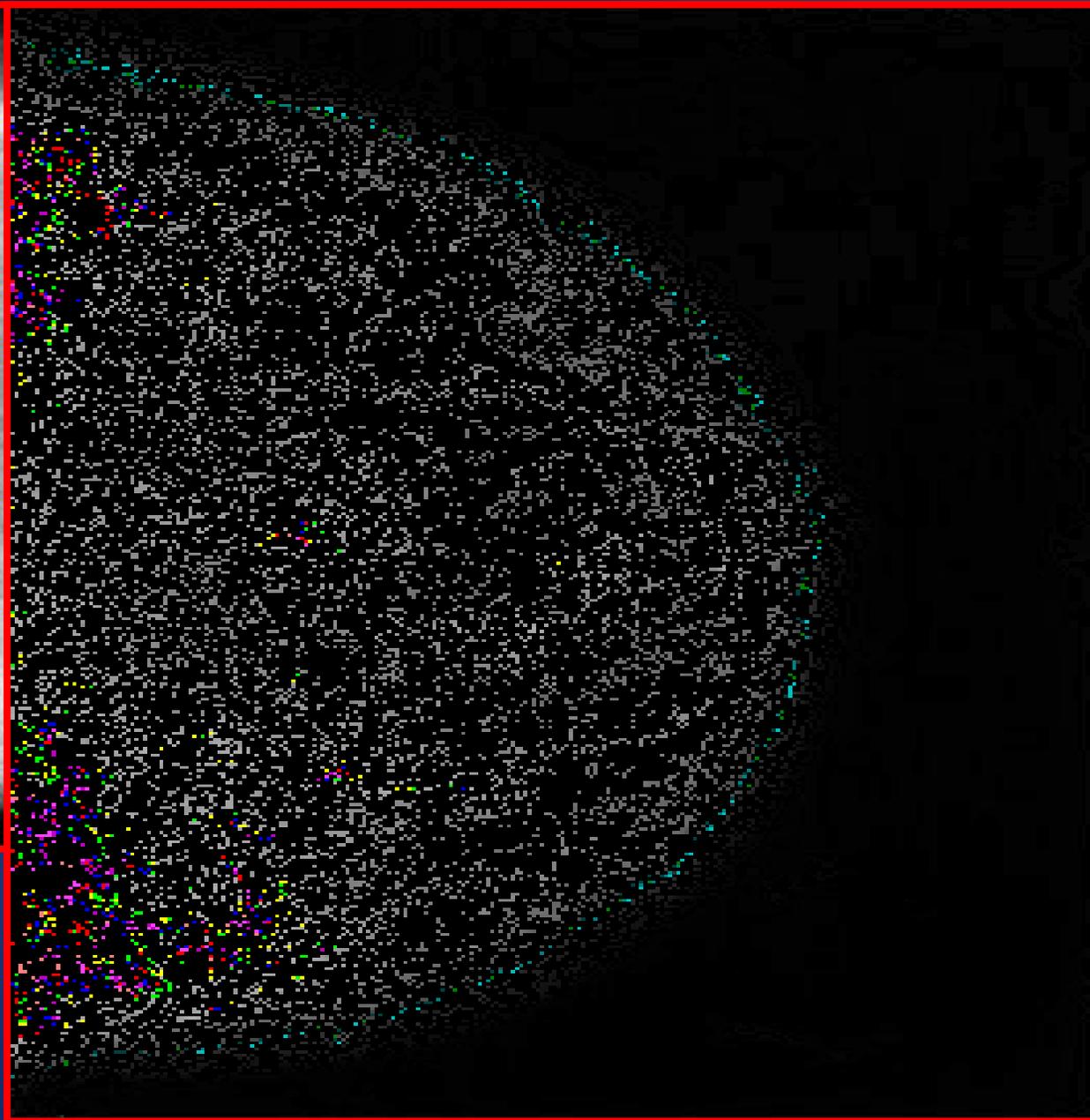




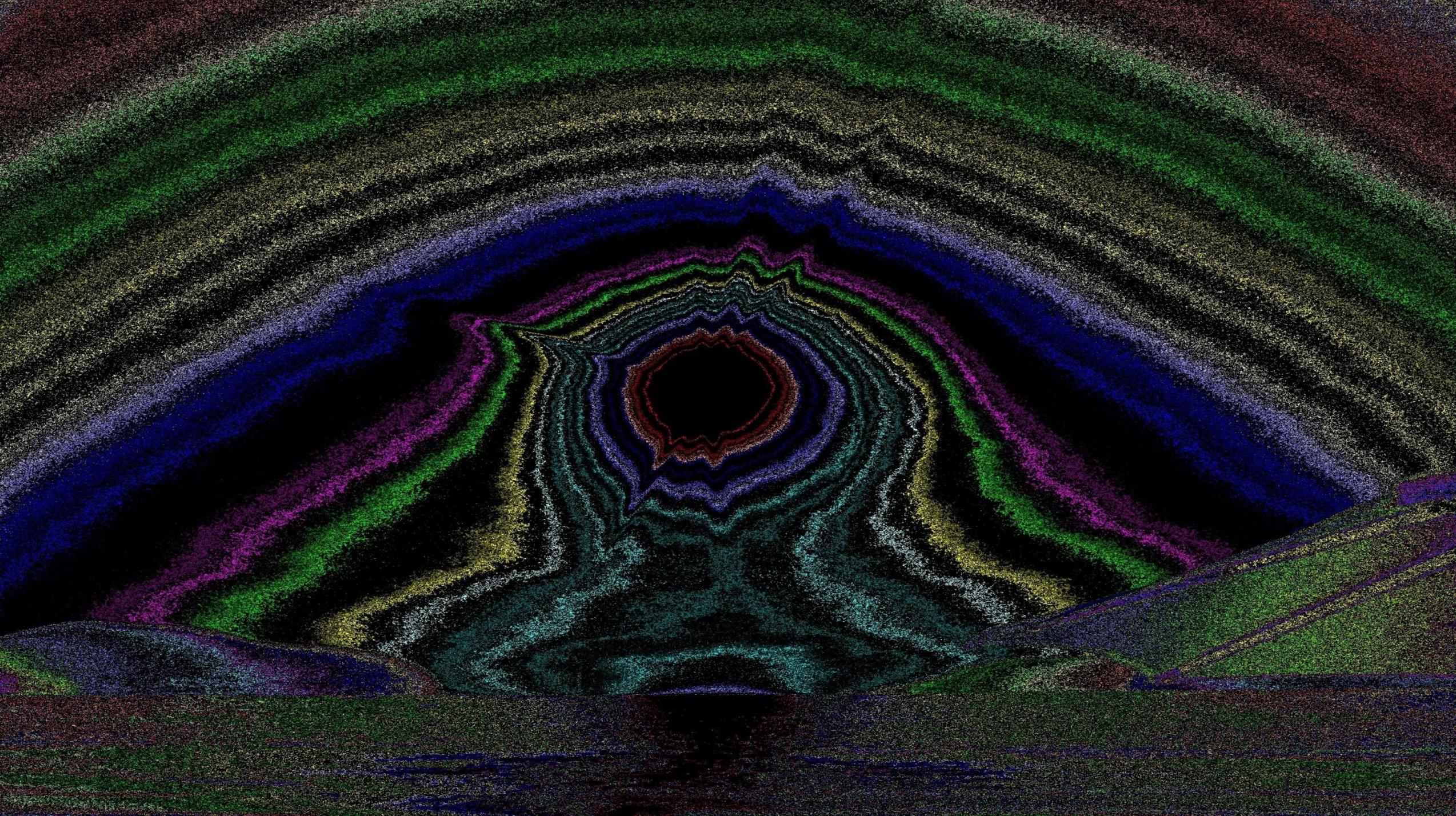


# PLASMOCITOMA





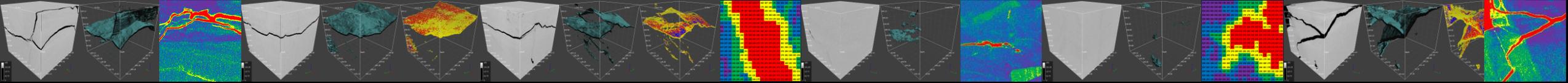




# POWER LAWS AND SCALING (HYPERBOLIC OR PARETO DISTRIBUTIONS):

- $M(R) \propto R^{-D}$
- $N(r) \propto r^{-Ds}$ 
  - $L(r) \propto r^{(1-D)}$
  - $A(r) \propto r^{(2-Dm)}$

$$\Pr(U > u) \propto u^{-D}$$



## 1. *Cyber Physical Systems (CPS)*

**«Agil Software»**

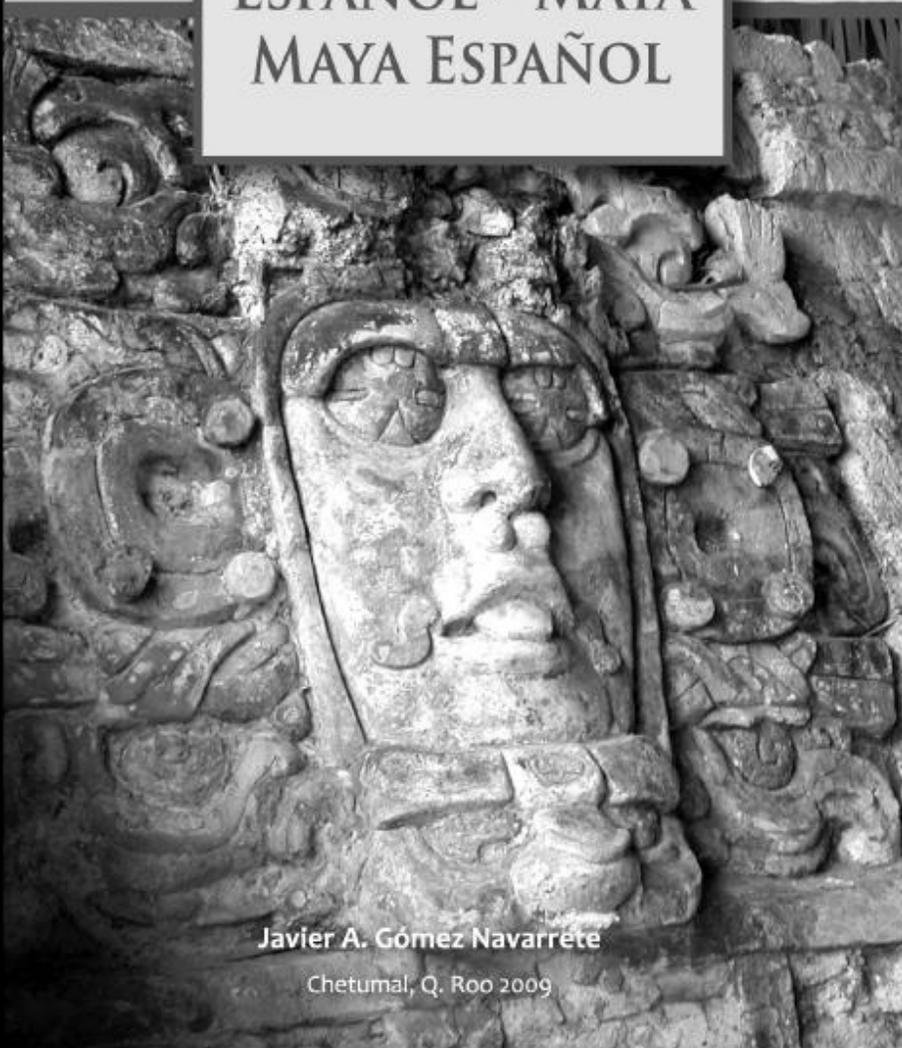
**«Muuk' il Kaab»**

Пользователь прямым образом участвует в доработке и дизайне новых алгоритмов необходимых для оптимальной работы **Комплекса: УММА+ Software**, в каждой конкретной ситуации, с целью принятия решений в реальном времени и уменьшения до минимума ошибок в планировании последующих операций по разведке, разработке или добыче.



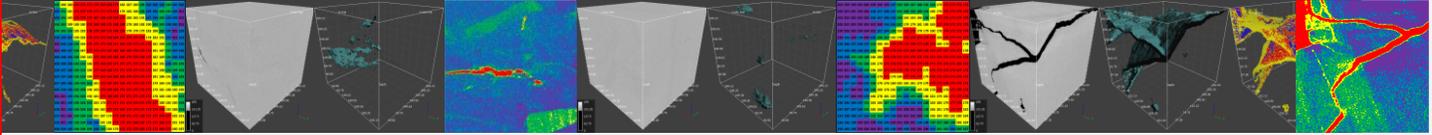
# Diccionario Introdutorio

ESPAÑOL - MAYA  
MAYA ESPAÑOL



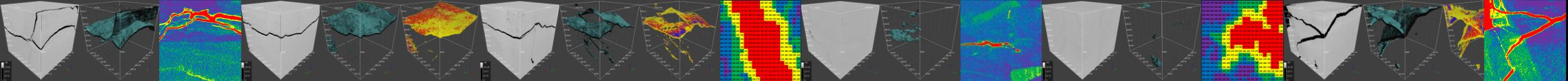
Javier A. Gómez Navarrete

Chetumal, Q. Roo 2009



**2. “DNA” of Big Data (BD);**

***3. “Kádon”: the unit of  
genetic Big Geo Data  
code of information;***



# «УММА»: УНИКАЛЬНАЯ ТЕХНОЛОГИЯ

*Универсальная Метрологическая*

*Эталонная Машина для Аналого-Цифрового*

*Преобразования, Масштабирования*

*(скэйлинга), Количественной*

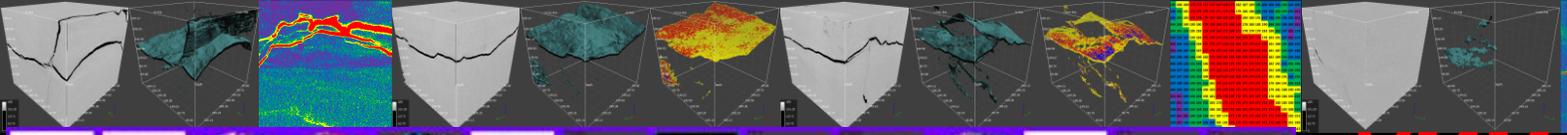
*Интегрированной Интерактивной*

*Интерпретации Сейсмических данных 3D-4D*

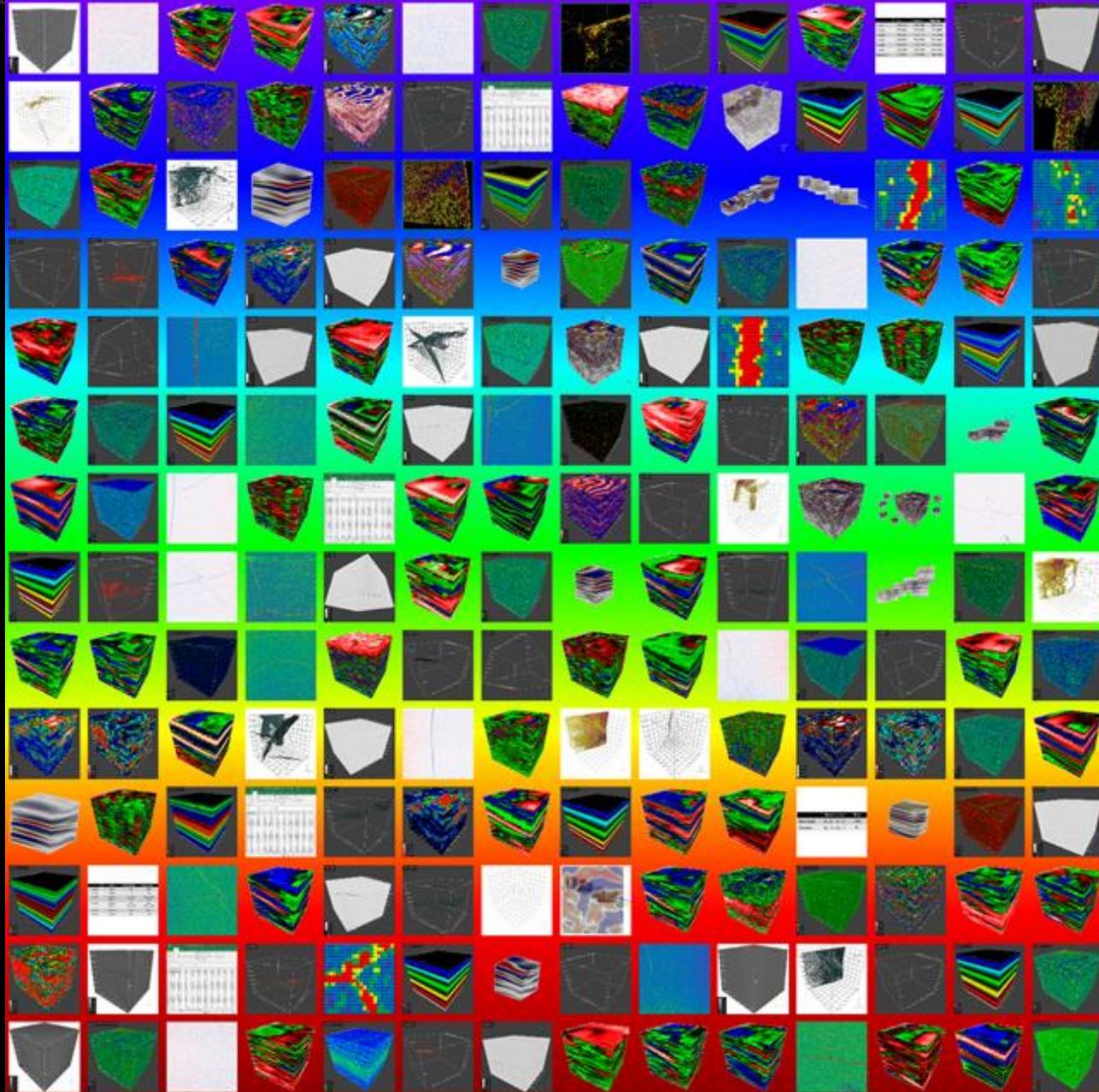
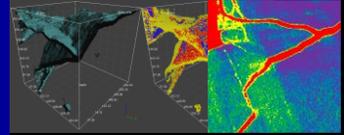
*и скважинных исследований, Трещенно-*

*Кавернозных Газо-Нефтяных Коллекторов.*

К. Олешко, 01-04-2019



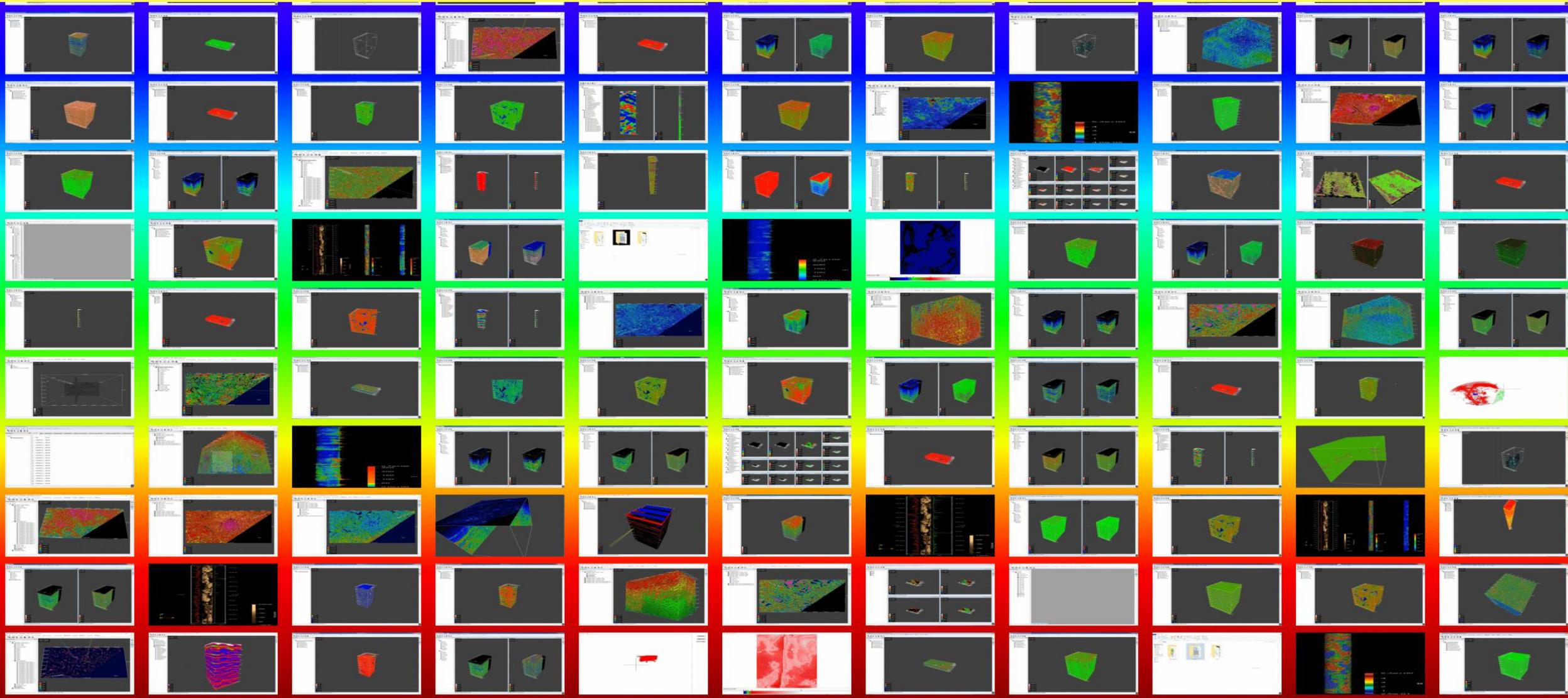
**ПРИМЕР:**



**YMMA Картирует данные Сейсморазведки 3D-4D (включая Томографию) и Микро - Томографии Рентгеновских лучей, интегрируя их со скваженными данными (Well Logging), с целью документировать масштабную инвариантность (multiscaling) атрибутов Трещин и Каверн.**

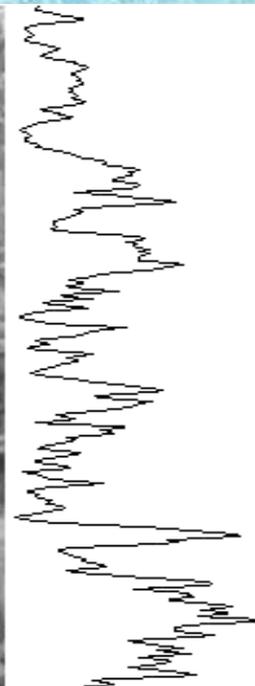
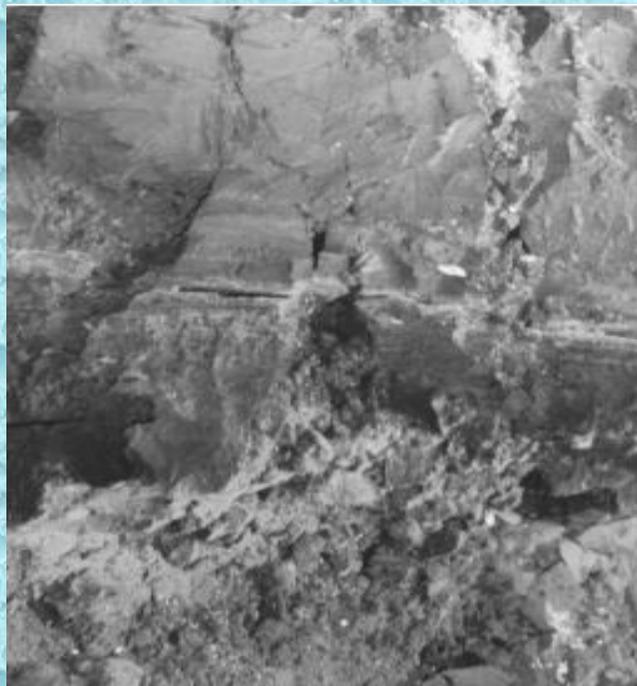
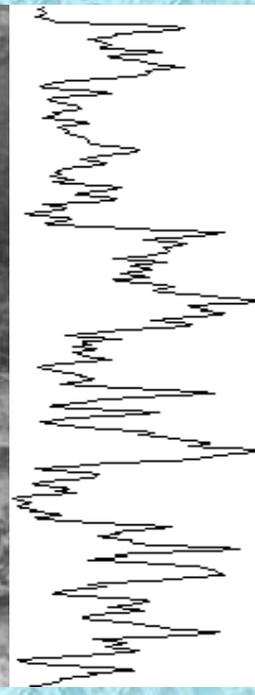
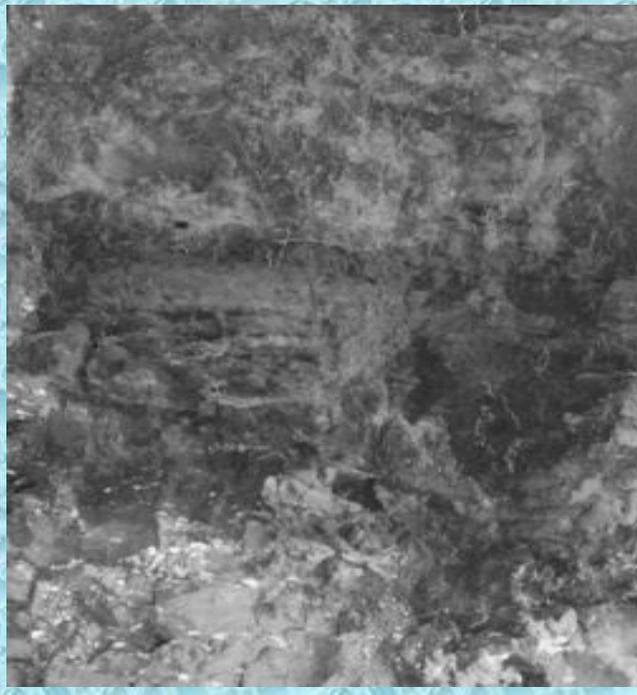
# ОСНОВНАЯ ПРОБЛЕМА ИНДУСТРИИ:

*GeoComplexity* (неоднородность, анизотропия, варьирование в пространстве, динамика Природных Резервуаров Углеводородов).

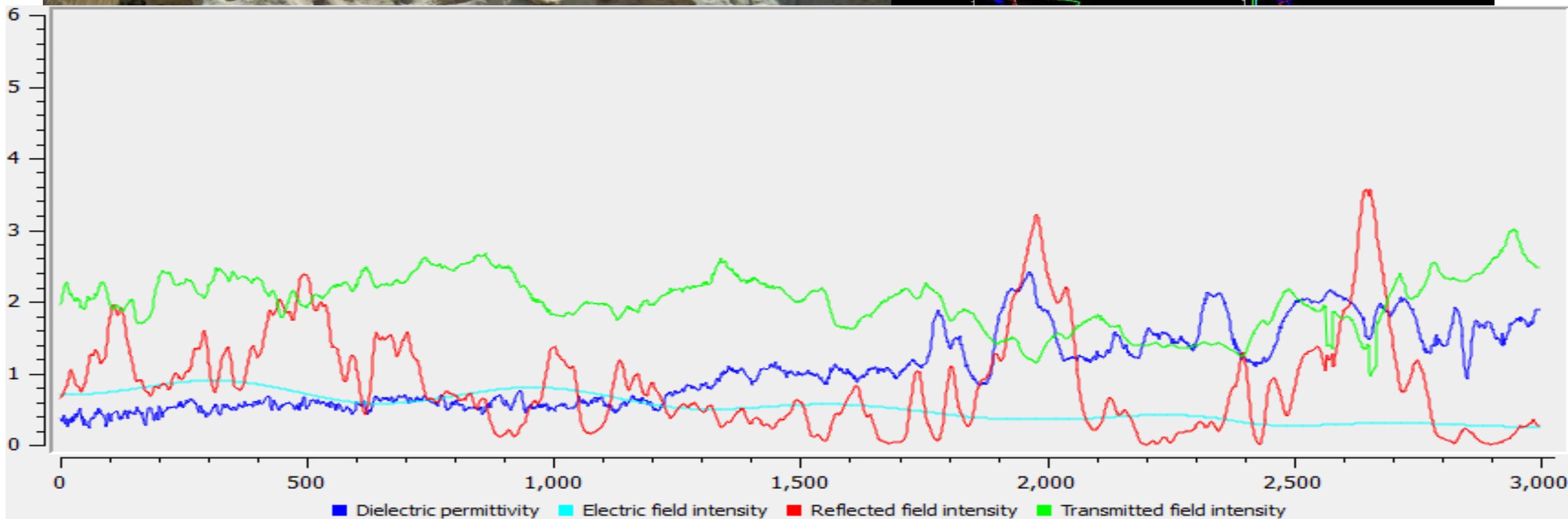


# MONOLITO DEL EX-LAGO DE TEXCOCO





**Perfil Ex-  
lago de  
Texcoco**



Statistics

Analyzed rows: **2995**

	Reflected	Transmitted
Max	0.3569	0.3019
Min	0.0001796	0.09488
Avg	0.08557	0.2004
I	0.02592	0.2471
Ir + It		0.273

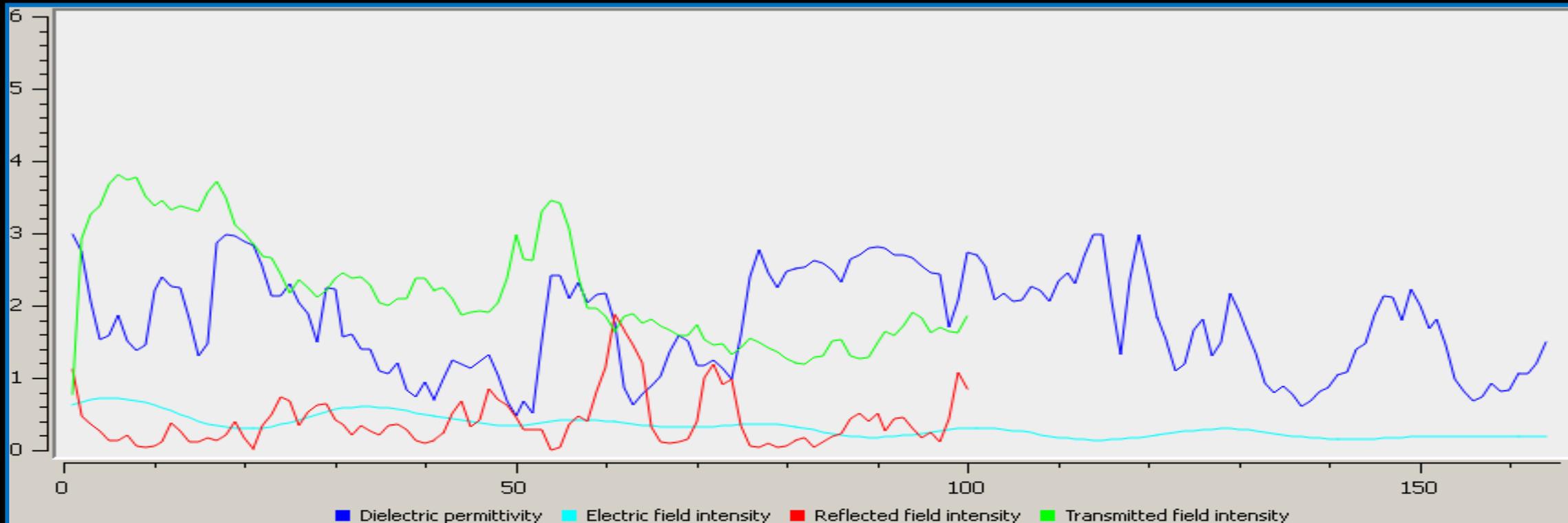
Parameters

Maximum Dielectric Permittivity	4
Length of structure	10 m
Wave length	4 m
Depth	3000
Length	4000
File name	D:/Images/2/site3-close-2.txt
Transparent color in input file	Black

...



# Paquete Maxwell-2013



## Statistics

Analyzed rows: **100**

	Reflected	Transmitted
Max	0.1872	0.3811
Min	0.0007139	0.07666
Avg	0.04039	0.2226
I	0.08482	0.1857
Ir + It	0.2706	

## Parameters

Maximum Dielectric Permittivity	4
Length of structure	10 m
Wave length	4 m
Depth	164
Length	218
File name	FRACTURE-FI.TXT
Transparent color in input file	Black

...

# MODELACION

## I. Modelo teórico:

$$A(t) = \sum_{j=1}^{N \rightarrow \infty} I(q_j) n_j(q_j) e^{iq_j ct}$$

$n_j$  es el número de elementos que reflejan:

$$n_j(q_j) \propto q_j^D$$

La distribución de  $A(t)$  medida por el GPR es un fractal auto-afín, generalizado por la función de Weierstrass:

$$D = 2 - H$$

$$A_j(q_j) \propto q_j^{-H}$$

# MODELACION

## II. Modelo matemático - Base del paquete de cómputo:

$$\frac{\partial^2 E(Z)}{\partial Z^2} + K^2 (\text{sen}^2 \theta_0 + \varepsilon(Z) - 1) E(Z) = 0$$

donde:  $K = \omega/c$  vector-onda en el vacío;  $\omega$ -frecuencia cíclica y  $\varepsilon(Z)$  permitividad dieléctrica del material.

→

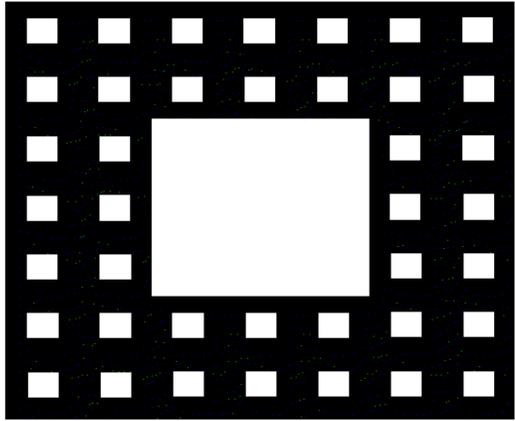
Condiciones de frontera:

- Izquierda:  $E'_z(0) + i\gamma_0 E(0) = 2i\gamma_0 l_0$

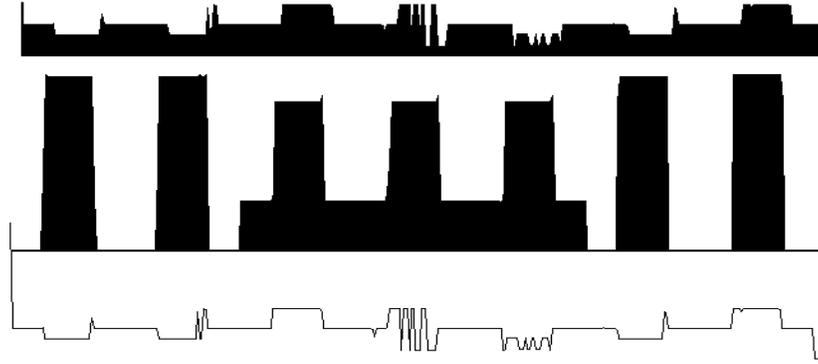
$$\gamma_0 = \kappa \text{sen} \theta_0, \quad i = \sqrt{-1}$$

- Derecha:  $E'_z(L) - i\gamma E(L) = 0$

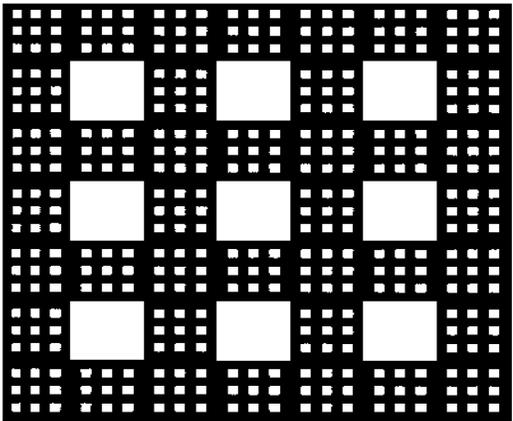
$$\gamma = \kappa \sqrt{\text{sen}^2 \theta_0 + \varepsilon(L) - 1}$$



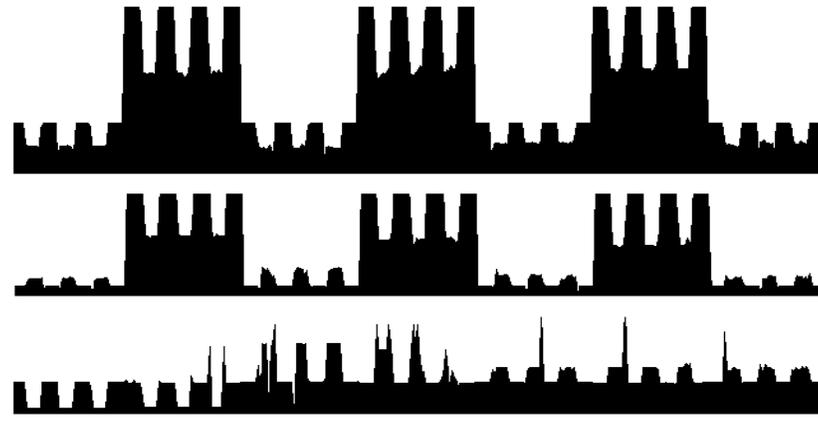
$$D_b = 1.8957$$



$$D_{R/S} = 1.4221$$



$$D_b = 1.8957$$

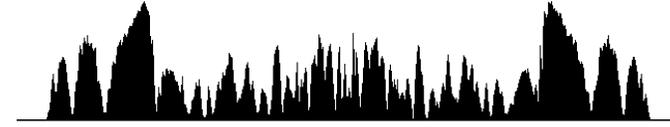
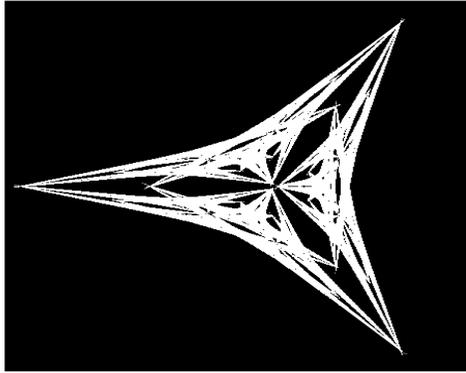


$$D_{R/S} = 1.8820$$

**Fractales determinísticos:  
Carpetas de Sierpinski  
 $D = \ln N / \ln 2$**

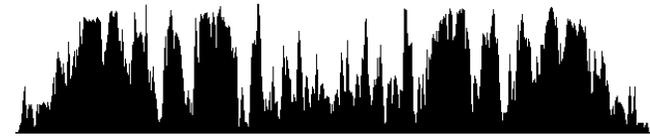
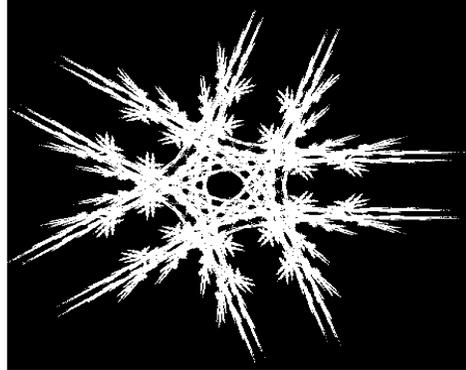
# *Fractales sintéticos*

$$D_b = 1.7031$$



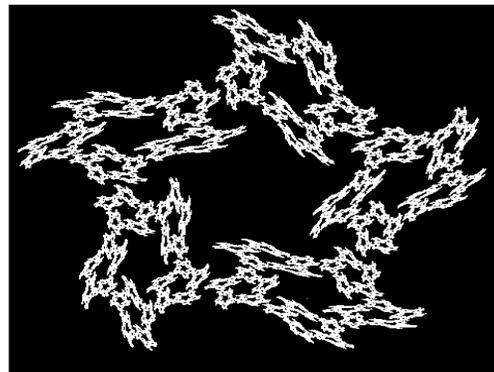
$$D_{R/S} = 1.706$$

$$D_b = 1.7997$$



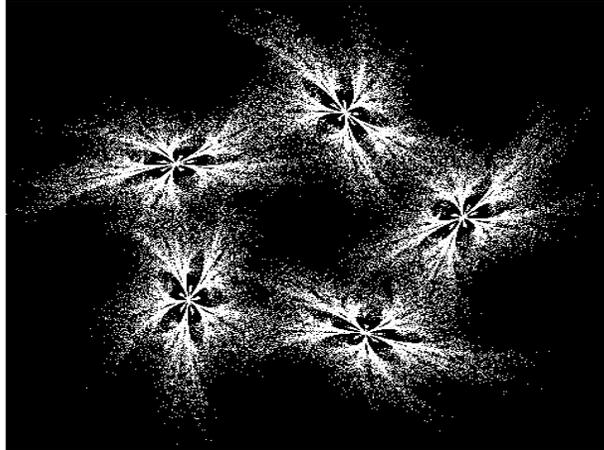
$$D_{R/S} = 1.777$$

$$D_b = 1.6776$$

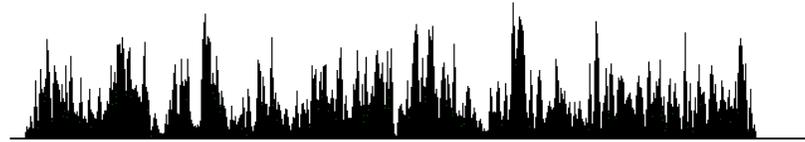


$$D_{R/S} = 1.6390$$

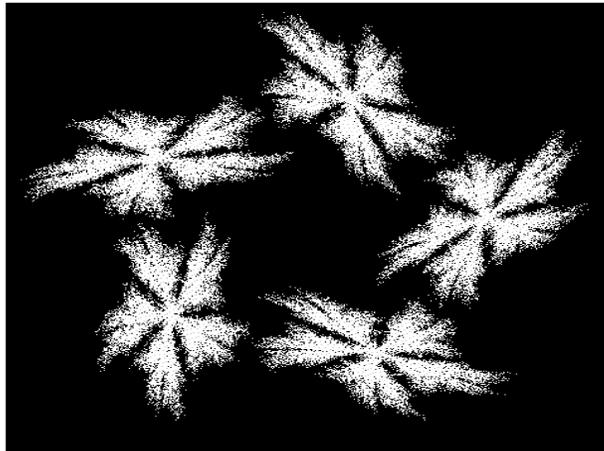
**Ruido rosa ( $1/f$ ):**  
**Espectro de potencia  $G_{1/f}(f) \propto f^{-1}$**



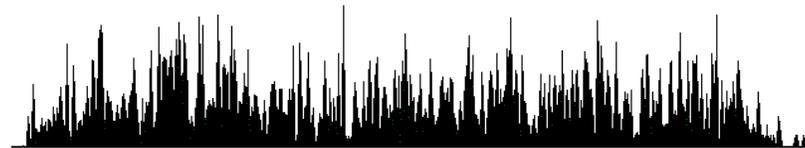
$D_b = 1.7241$



$D_{R/S} = 1.752$



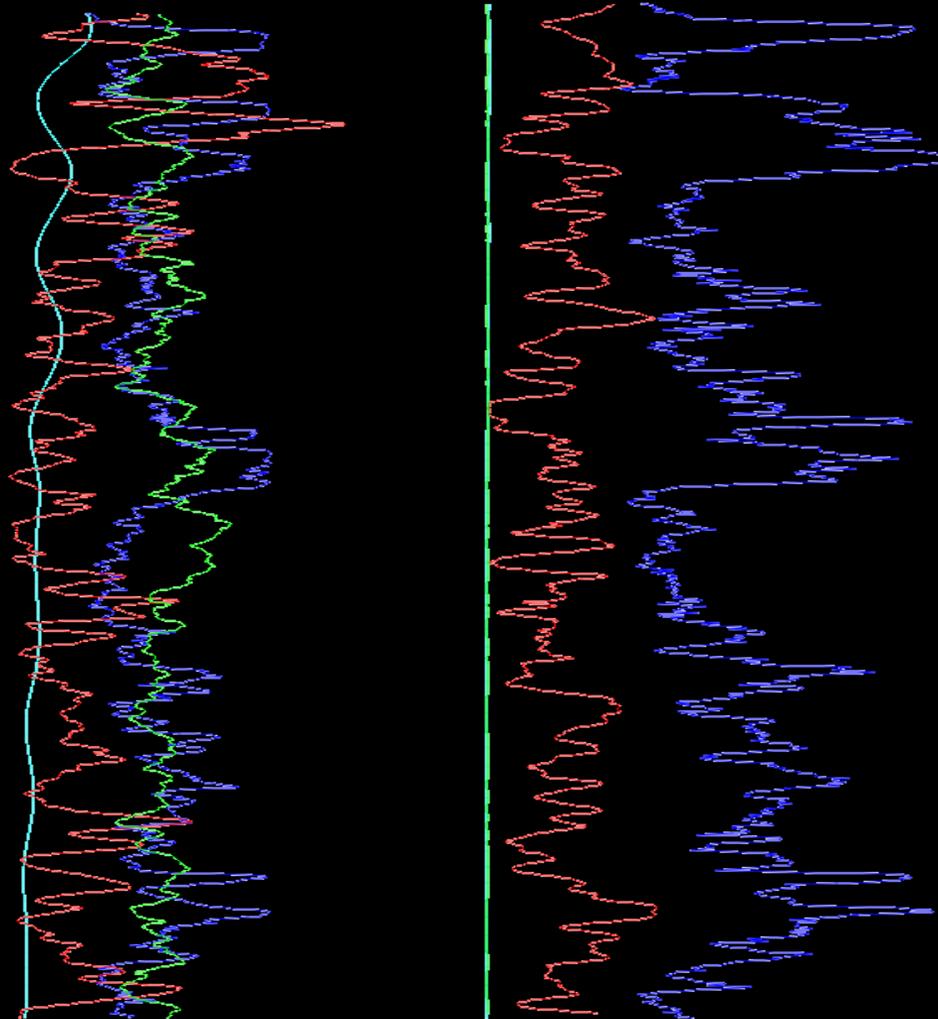
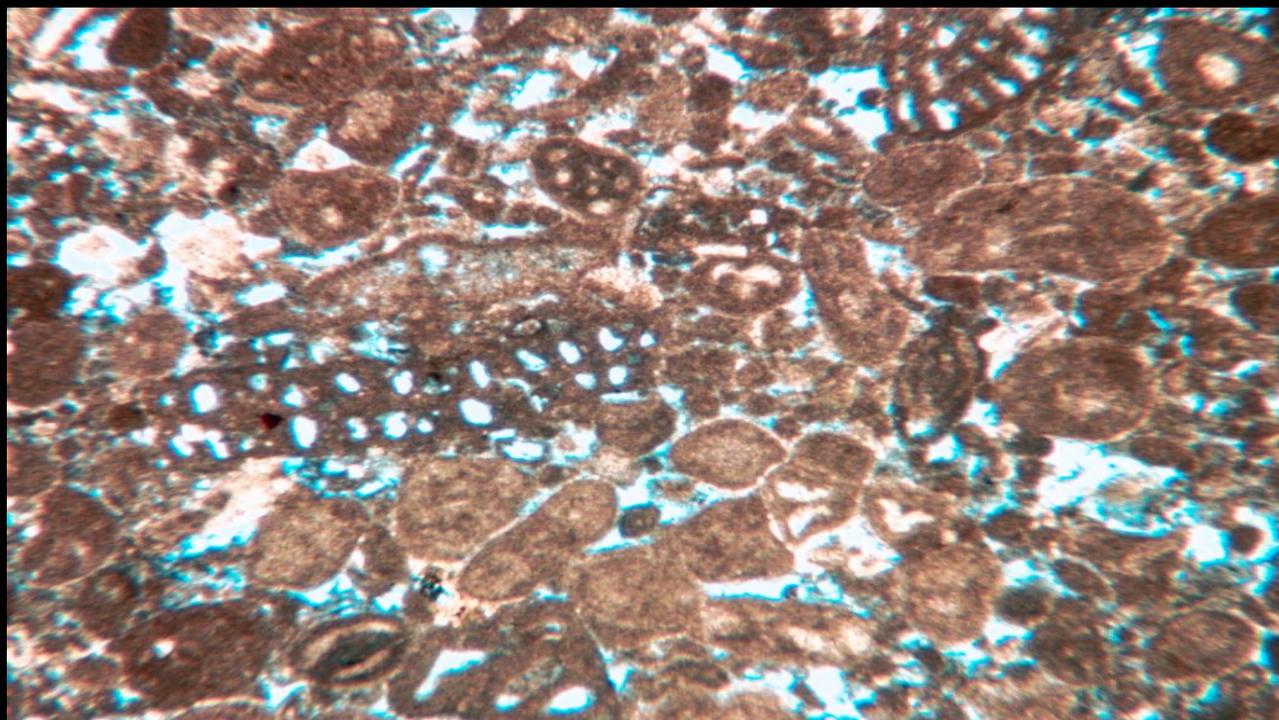
$D_b = 1.7095$



$D_{R/S} = 1.697$

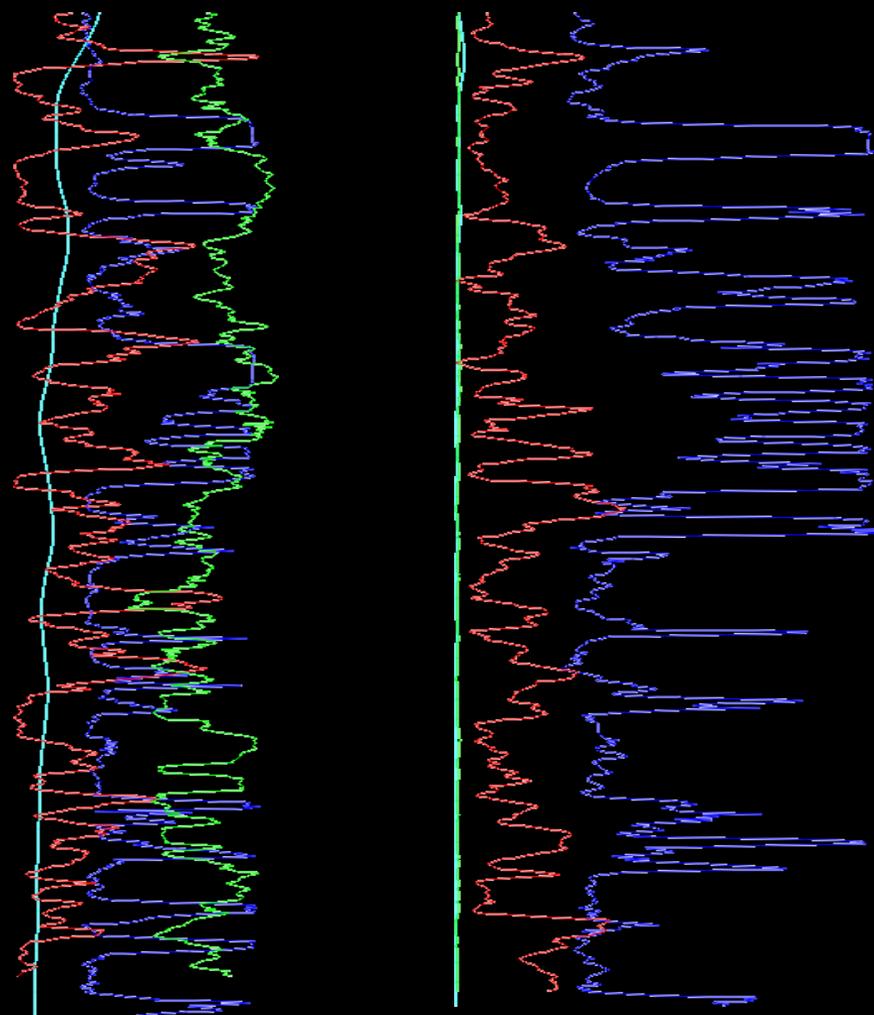
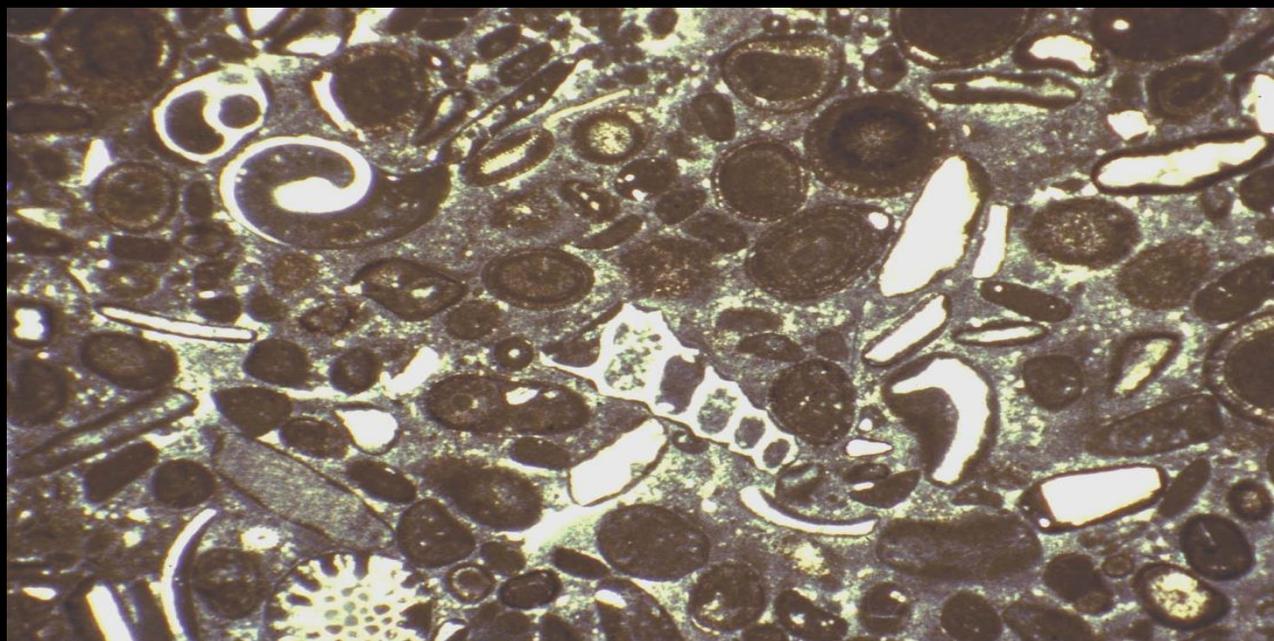


## 2 Packstone



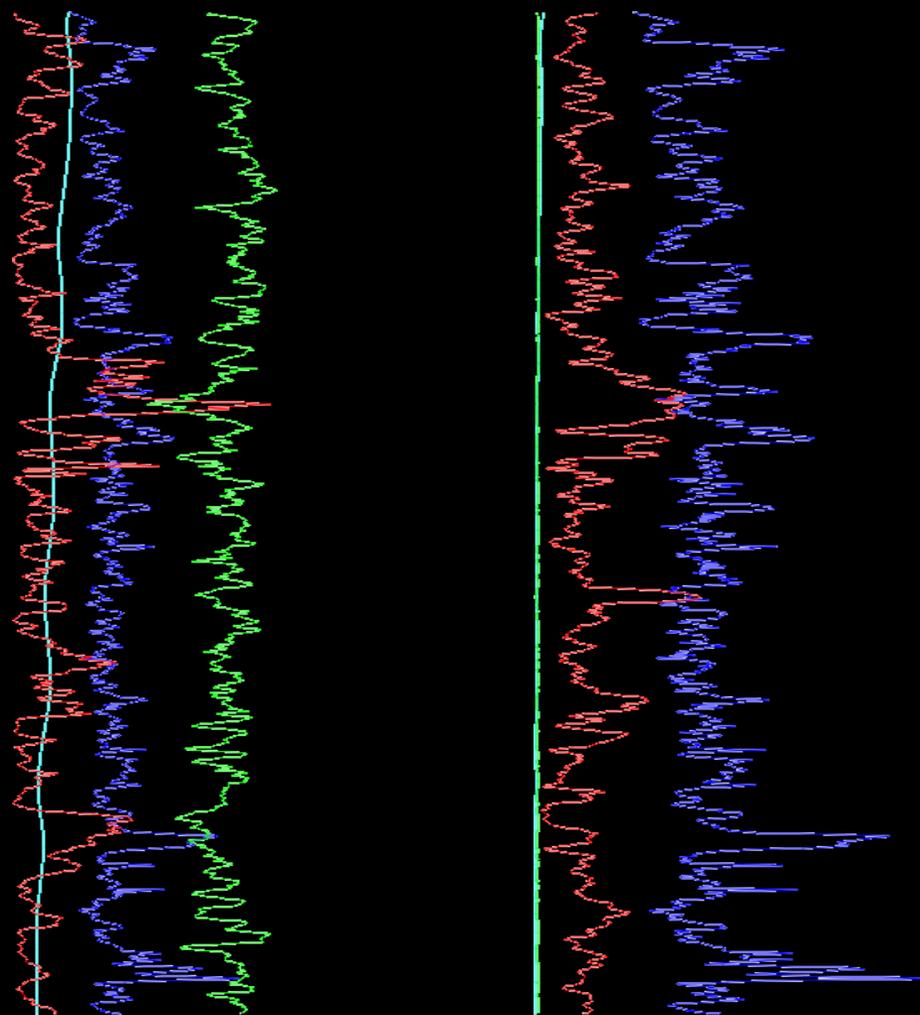
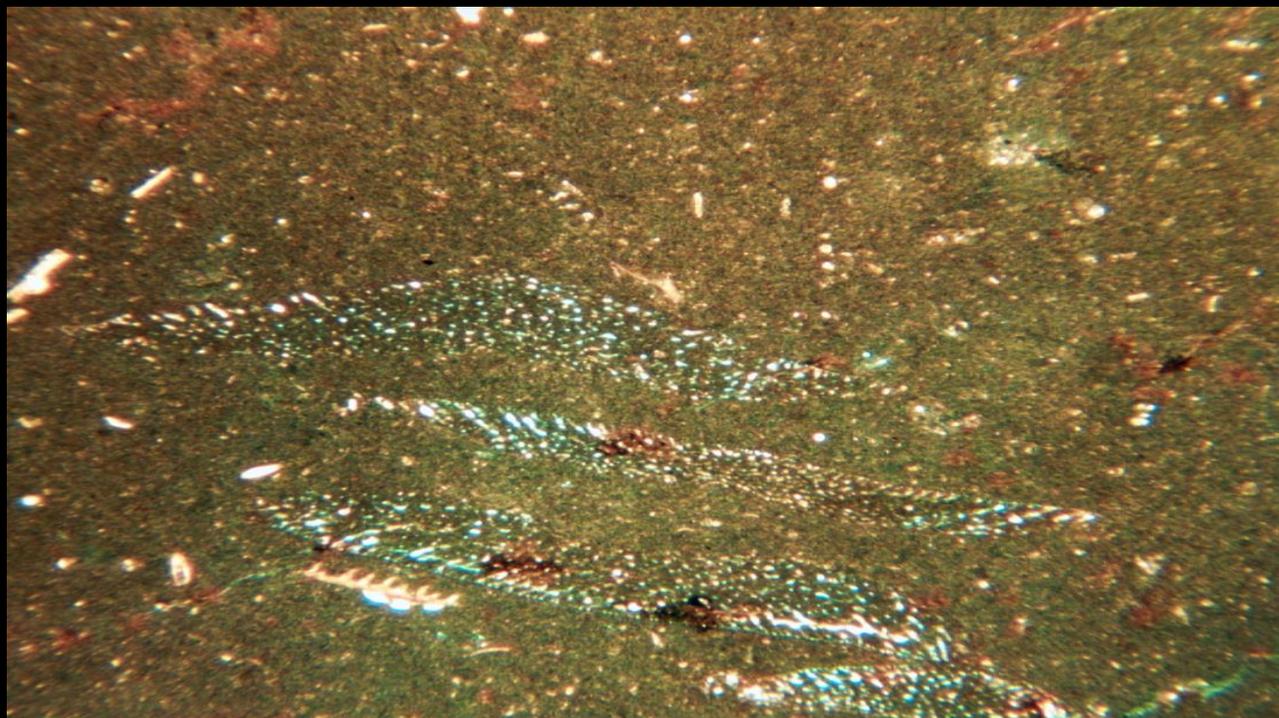


### 3 Packstone wackstone



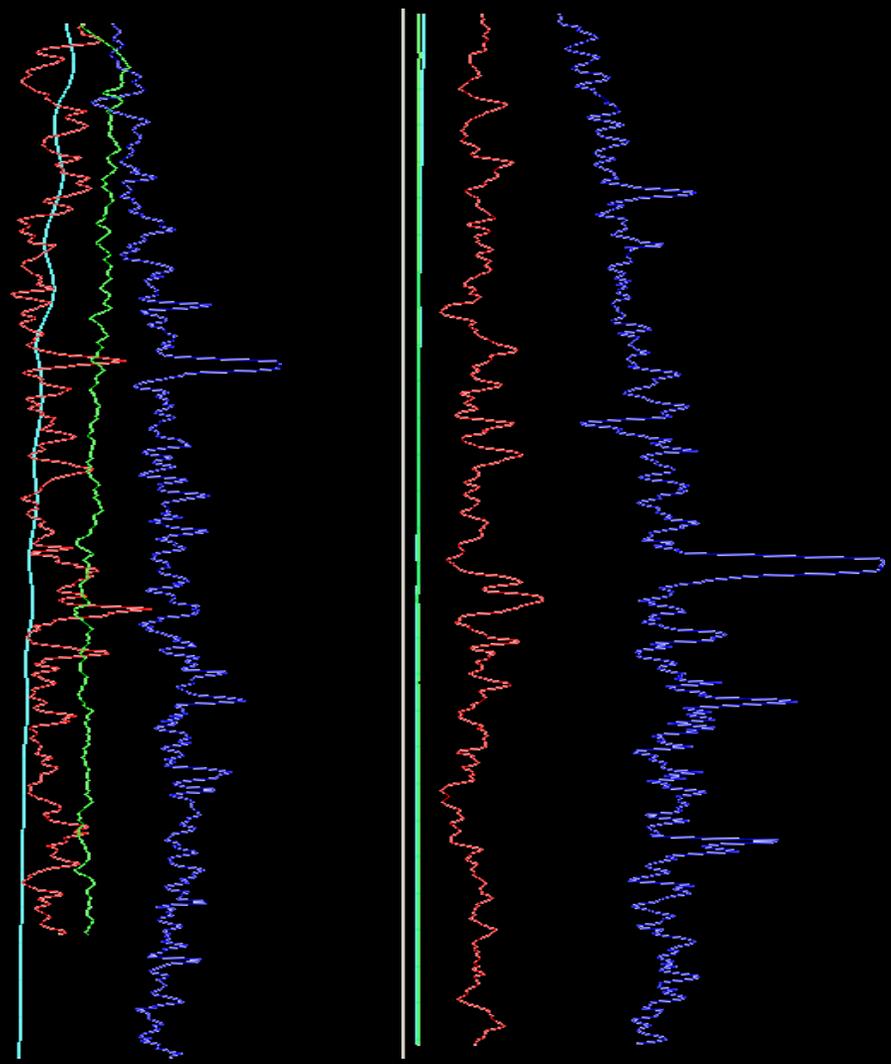
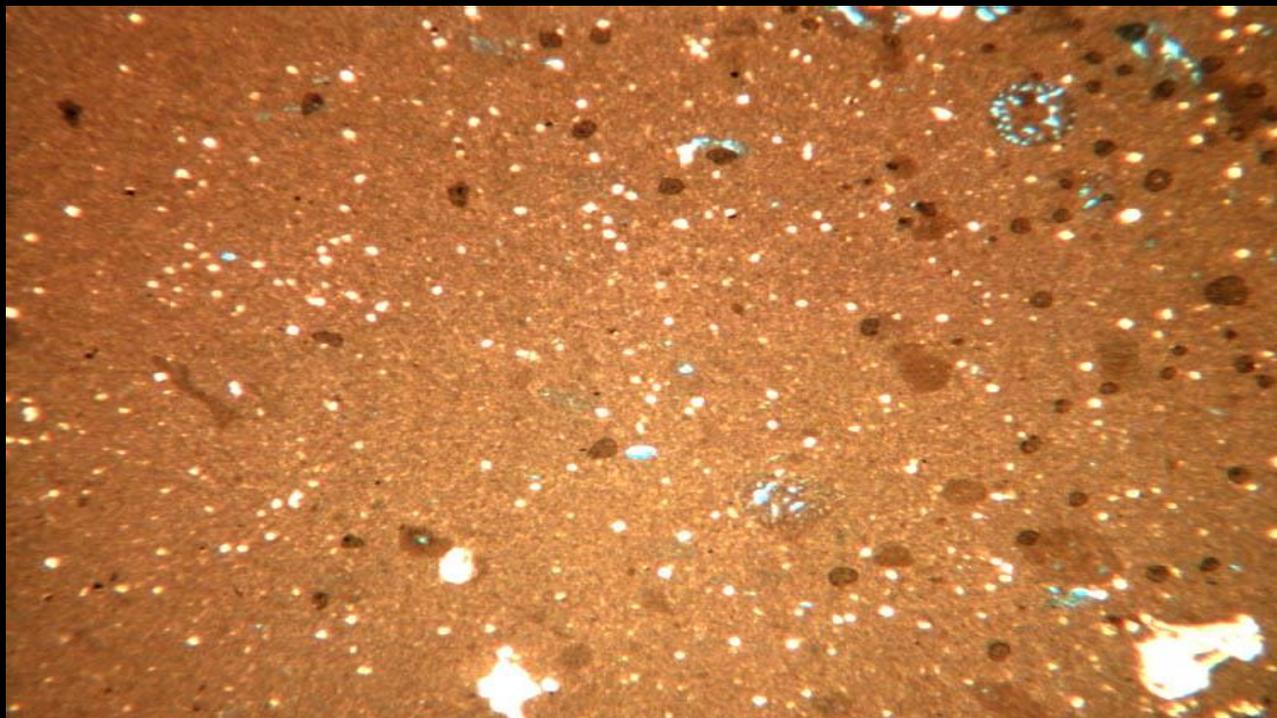


## Wackstone



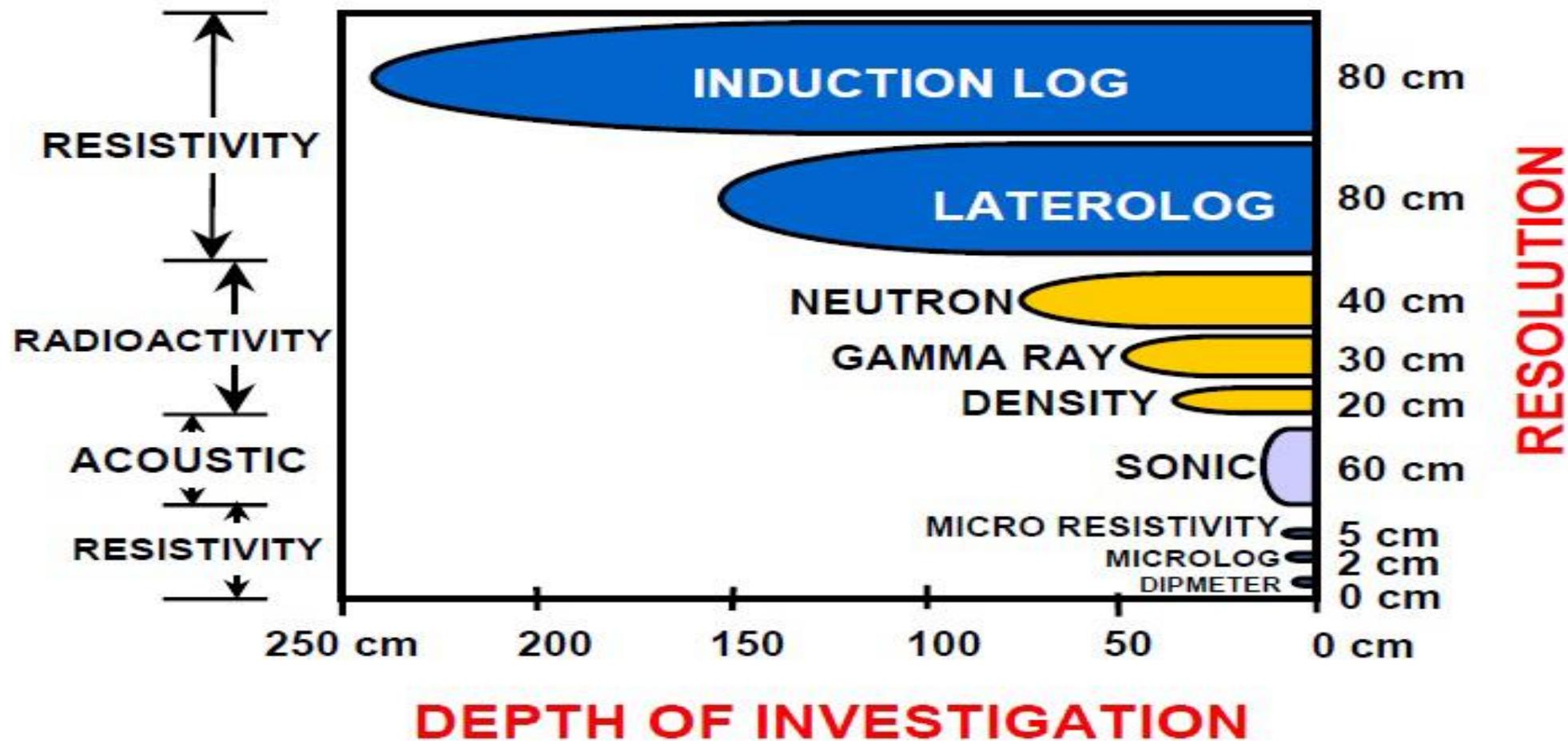


Mudstone





# Logging Tools





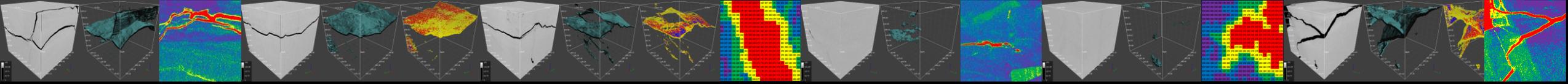
## НАШИ ГЛАВНЫЕ ТРЕНДЫ:

1. *Big GeoData* Анализ – *Data Science/Data Mining* -  
Deep Knowledge

2. *Deep Analytics* –  
Machine Learning

## ОСНОВНЫЕ ПРОДУКТЫ УММЫ:

1. Скелетонизация Многомасштабной Массивной Информации (*Big Geodata*) и Визуализация Фаций разной природы: от Сейсмофаций до Порофаций;
2. Многомасштабная Архитектура Резервуаров (КАРТЫ 2D и КУБЫ 3D):  
Количественная оценка и типифизирование степеней Неоднородности и Анизотропии Залежей;
3. Прогноз Нефтегазоносности и её Динамики во Времени и в Пространстве.



## **ГЛАВНАЯ ЦЕЛЬ:**

**Сведение к Минимуму Риска подготовки и реализации проектов развития нефтяных комплексов (с особым вниманием на распределение скважин в пространстве и их бурение);**

**Обеспечение Максимальной Отдачи Инвестиций.**



## КАК МОЖНО ЭТОГО ДОБИТЬСЯ В РЕКОРДНЫЕ СРОКИ?

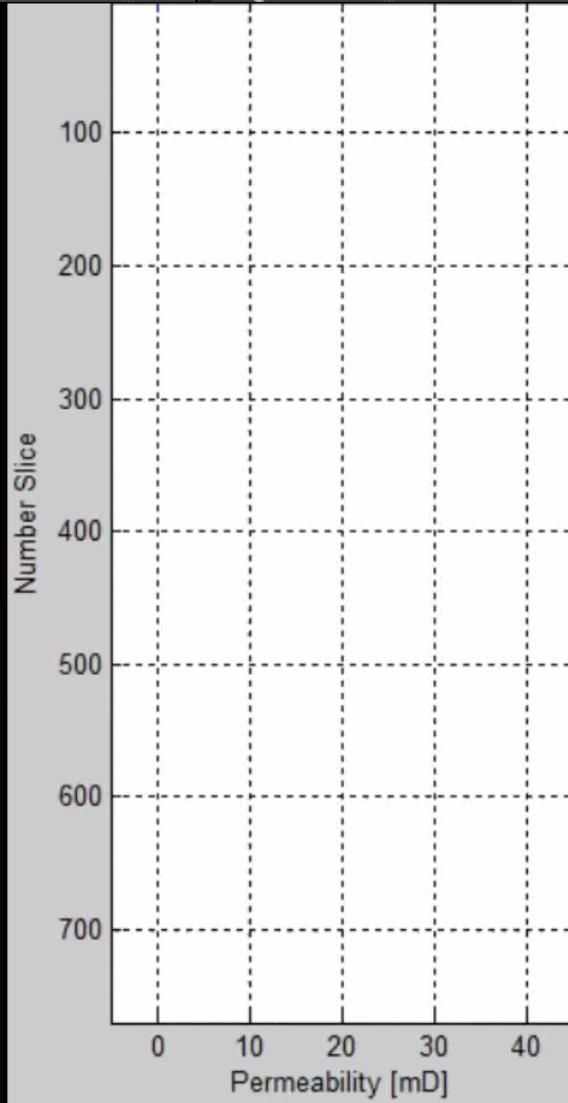
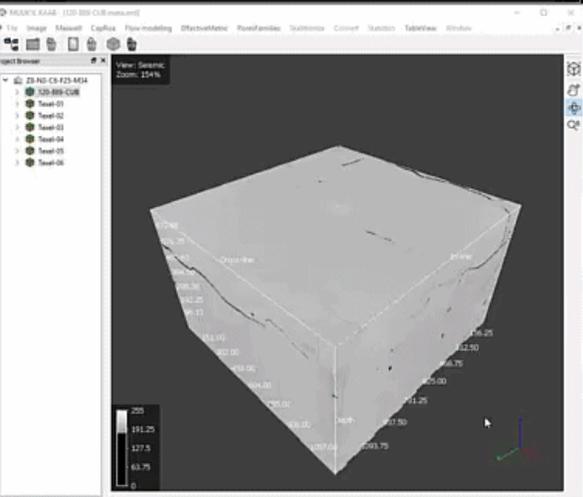
Путём Интеграции новых технологий анализа массивной многомасштабной информации, используемой в нефтяной промышленности для описания статических и динамических атрибутов коллекторов (от сейморазведки, каротажа, микроскопии, томографии и т.д., до экономических и социальных индикаторов) в Единую Эффективную Метрику и Аналого-Цифровую модель Нефтяного Коллектора

Что нужно для этого?

Единая Система Измерения, позволяющая измерять и сравнивать данные любой природы в безразмерных, нормализованных величинах распределённых в пространстве вероятности:  
Фрактальная (Мультифрактальная) Геометрия

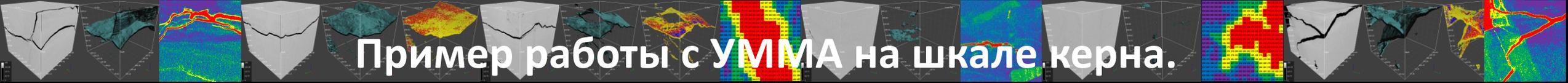
# ЧТО ИЗМЕРЯЕТ УММА:

От варьирования в пространстве *PoroPerm* (распределение Порозности и Проницаемости по глубине), до изменения объёма нефти или любого флюида во времени и пространстве.



**РЕШЕНИЕ ОБРАТНЫХ ЗАДАЧ И ПОСТРОЕНИЕ ЧИСЛЕННЫХ МОДЕЛЕЙ**

Пример результатов прогноза с УММА в горизонте с 5% порозности.



# Пример работы с УММА на шкале керна.

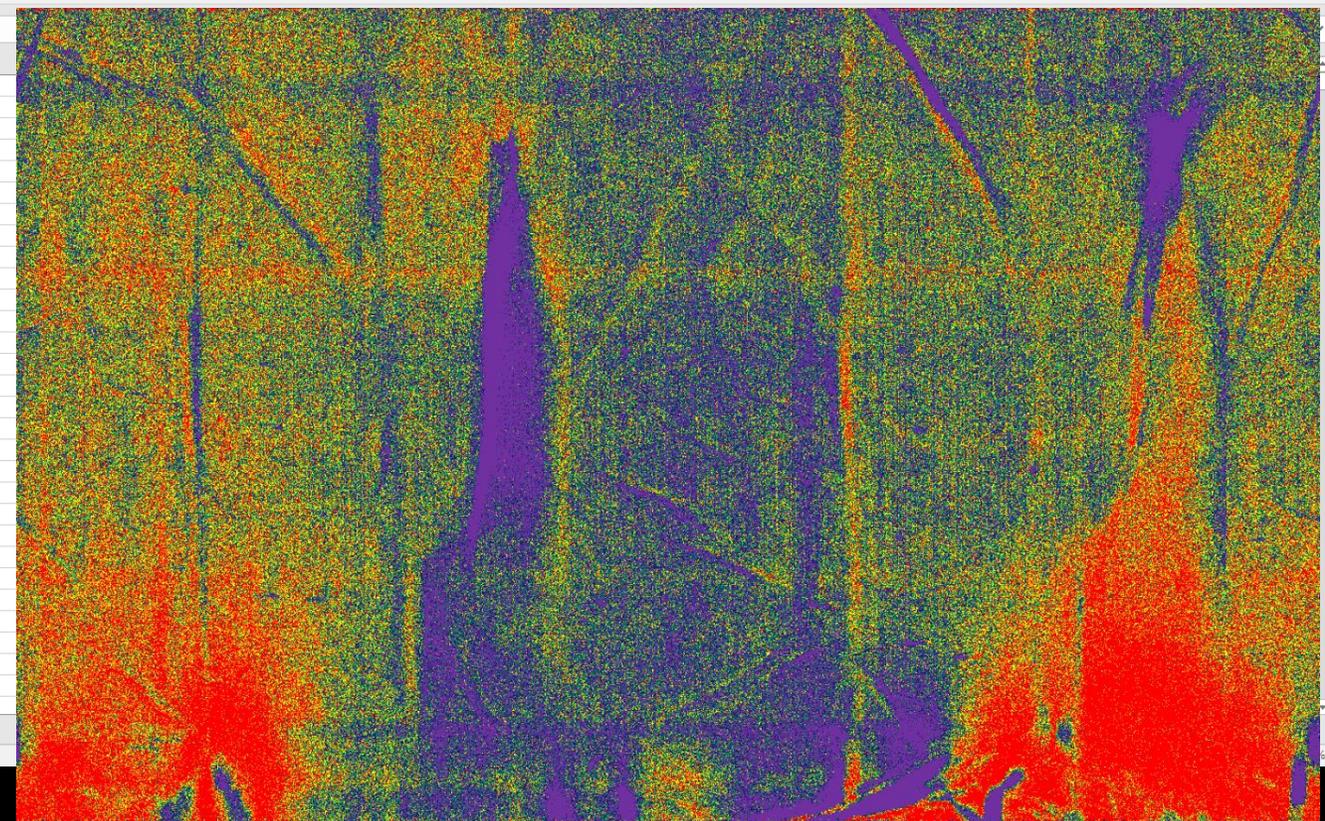
**Фрагмент породы**

**X-Ray Micro-Tomography**

**Карта отражённых от фрагмента породы лучей:  
основа для прогноза  
геомеханики.**



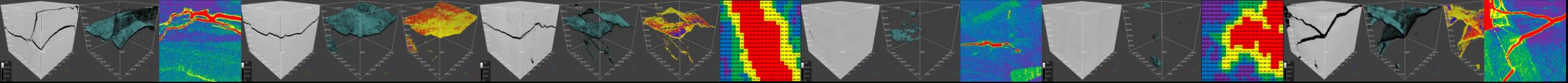
	A	B	C	D
1	62.32	62.18	62.12	62.14
2	30.56	30.09	30.15	29.66
3	30.36	30.2	30.12	29.54
4	30.29	30.32	29.85	29.8
5	30.51	30.24	29.9	29.69
6	30.21	29.93	29.87	29.65
7	30.22	30.11	30.19	29.74
8	30.12	30.13	29.81	29.62
9	30.41	30.32	29.92	29.75
10	30.09	30.17	29.85	29.75
11	30.19	30.16	30	29.9
12	30.57	30.14	29.94	29.75
13	30.46	30.3	30.03	29.94
14	30.72	30.28	29.84	29.88
15	30.94	30.31	30.17	29.96
16	30.88	30.72	30.24	29.85
17	31.5	30.9	30.44	29.95
18	31.65	30.93	30.4	29.87
19	31.85	31.22	30.45	30.12
20	32.04	31.54	30.8	30.1
21	31.93	31.54	30.94	30.53
22	32.12	31.26	30.67	30.52
23	32.07	31.65	30.91	30.24
24	32.22	31.58	30.54	30.24
25	32.07	31.9	30.89	30.15
26	32.37	31.63	31.03	30.34
27	32.65	31.78	31.08	30.72
28	32.47	31.88	31.48	30.72
29	32.7	31.99	31.42	30.93
30	33.28	32.14	31.36	30.85



**Численные Матрицы**

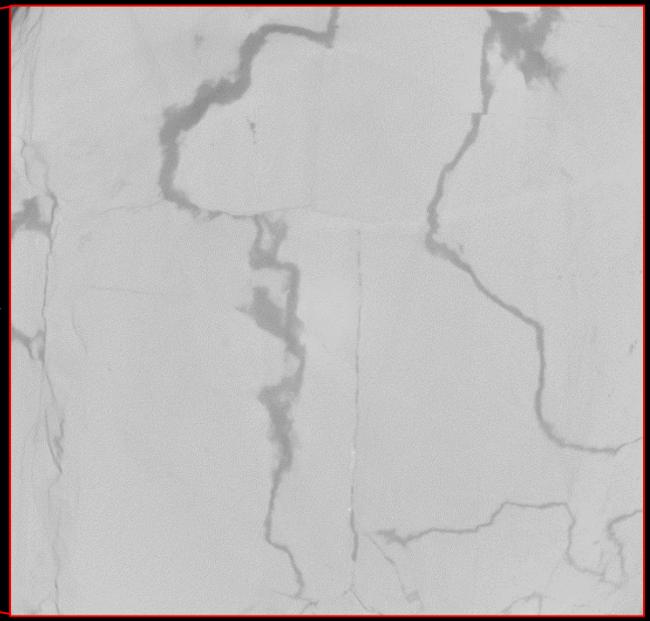
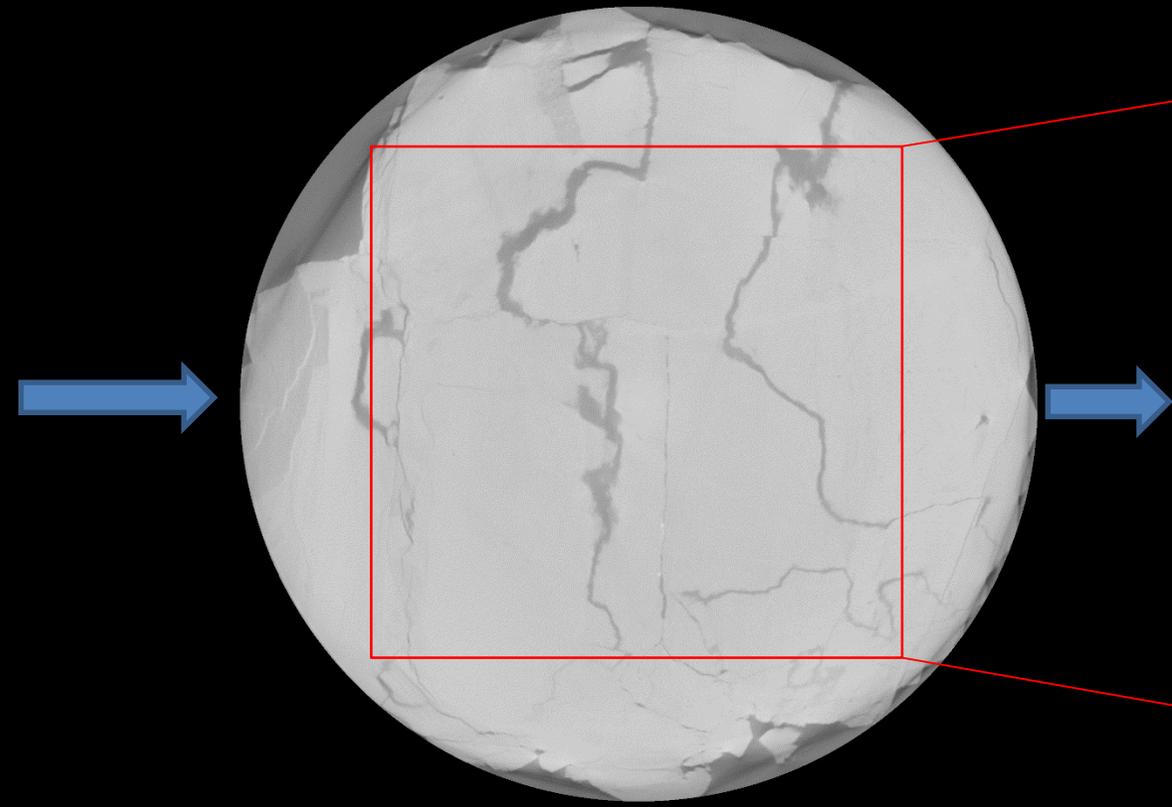
**ИНДЕКСЫ ИЗУЧАЕМЫХ АТРИВУТОВ**

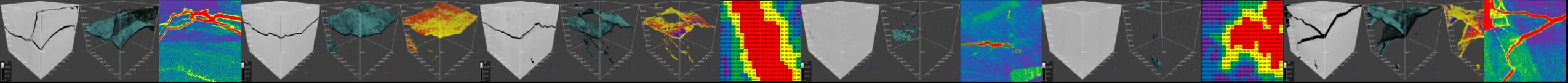




**1010 томографических срезов  
шкала=53.27  $\mu\text{m}$**

**Картирование  
интересующего  
сегмента**





# Общая Схема Работы с УММА:

## Многомасштабное Моделирование и Картирование

Данные  
Многошкального  
Анализа

Input

Разведочные  
Техники разной  
Физической  
ОСНОВЫ

Эффективная  
Метрика:  
Fractal  
Geometry  
(Multifractals)

Анализ  
Сложных  
Коллекторов

Output

Универсальная  
Аналого-  
Цифровая  
Модель  
Коллектора

Вибблиотека- Каталог  
Основных Атрибутов  
(Пример: Poro-Perm)

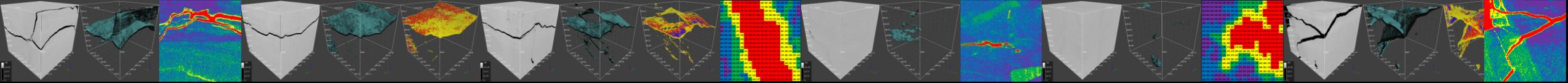
Нефтяная  
Залежь

Сеть  
Скважин

Топология  
Представительных  
Скважин

Физика Пород и  
Химия Нефти

Многошкальные  
поля PoroPerm

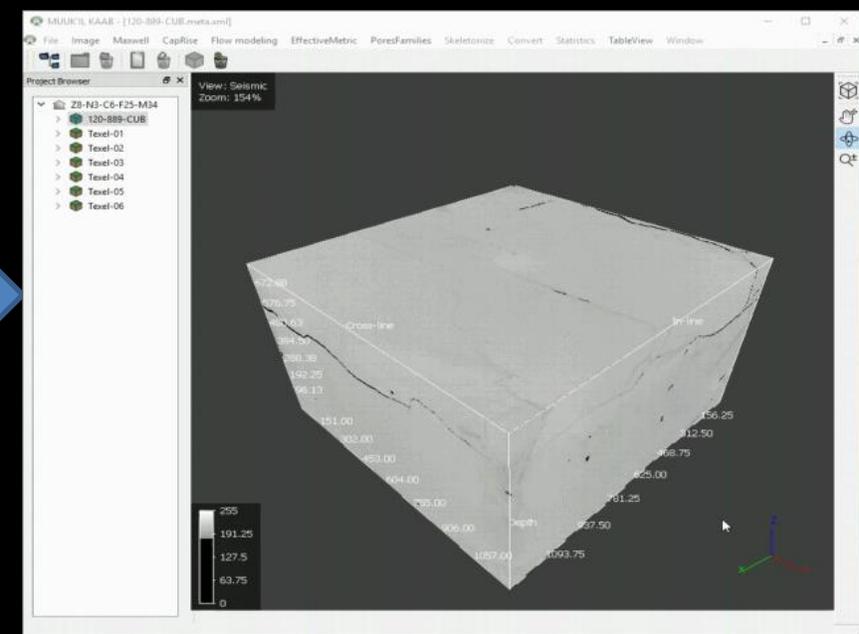
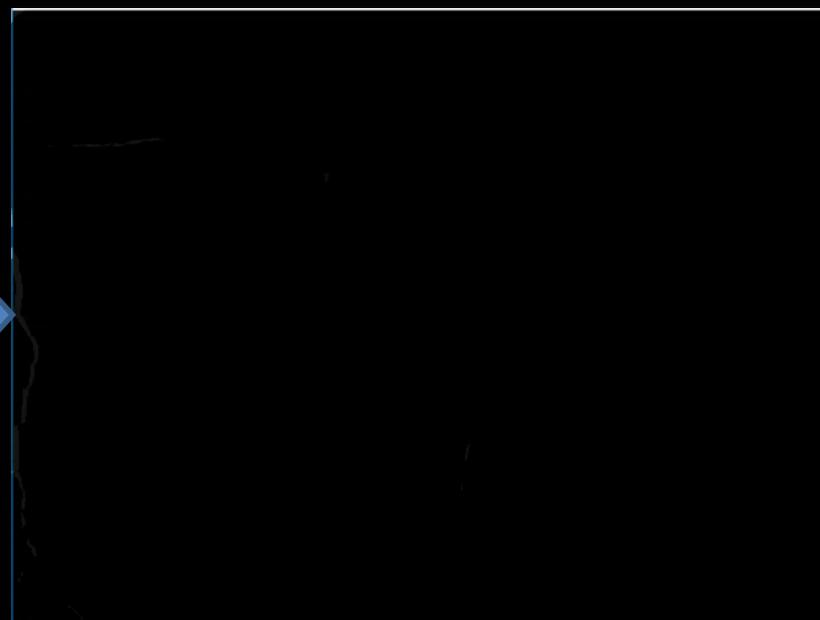
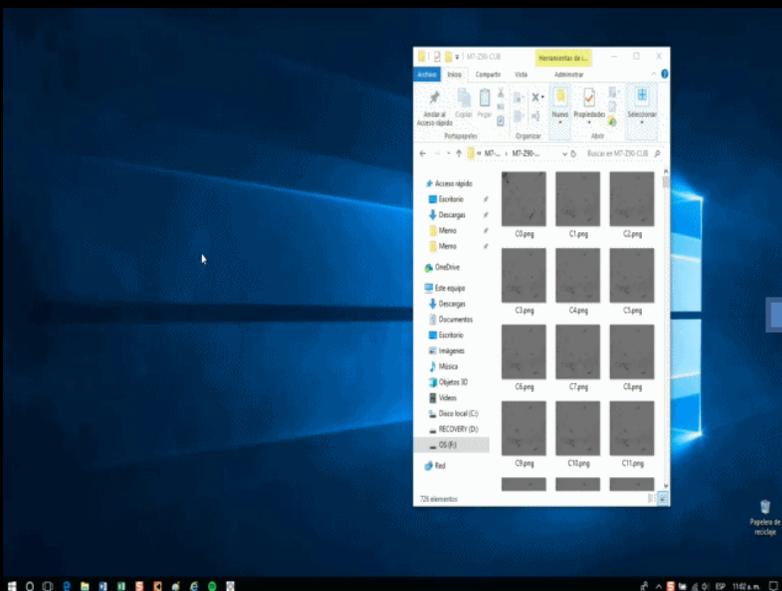


Software  
Muuk' il Kaab



Пример анализа УММА  
Бинарный Томографический  
Сегмент

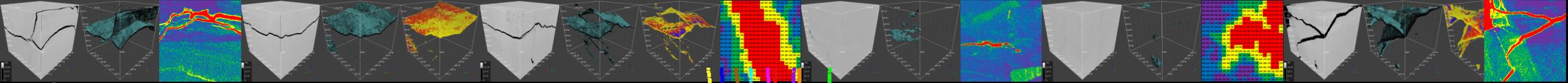
Восстановленное УММОЙ  
трёхмерное изображение



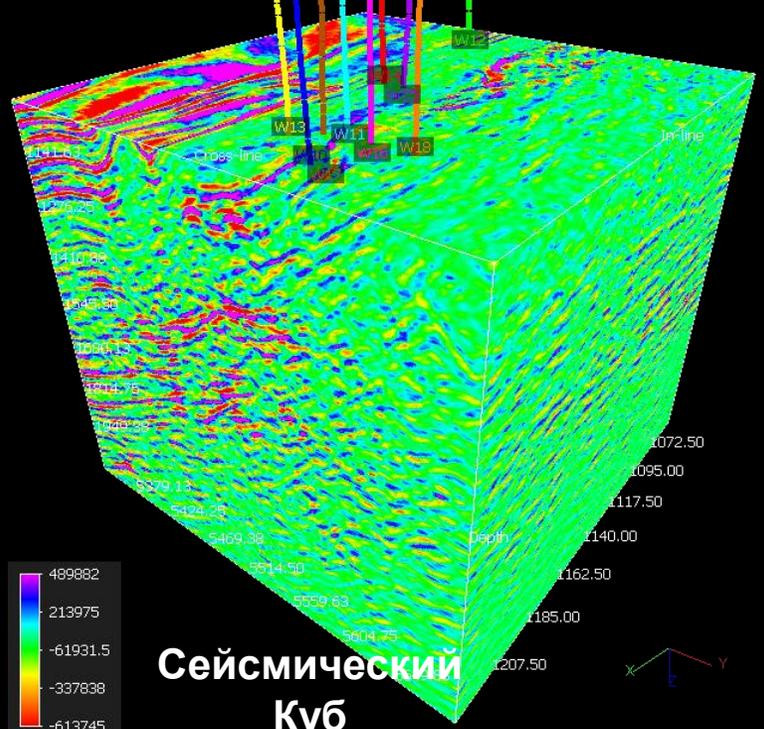
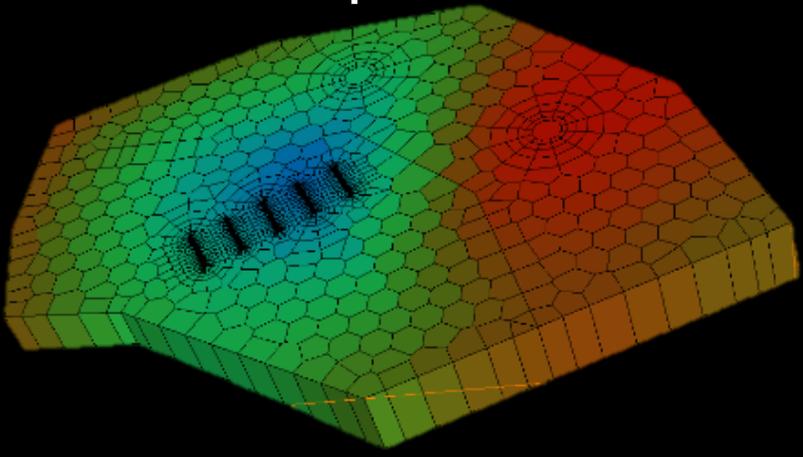
Вход: изображения в  
серых тонах

Software строит бинарные  
изображения и моделирует  
их PoroPerm

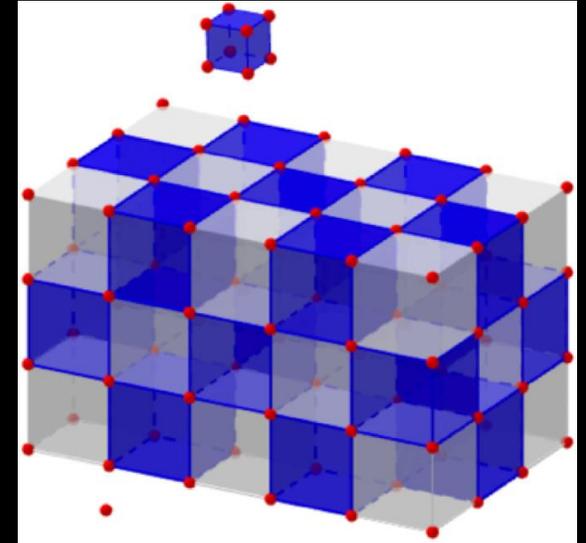
Восстанавливаются трёхмерные  
изображения исходных  
сейсмических и томографических  
кубов



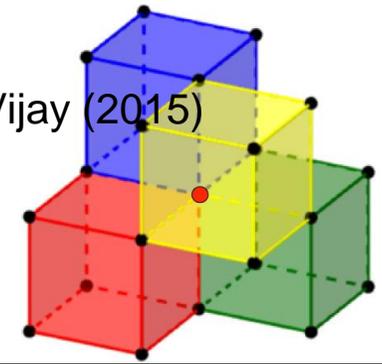
**Сравнение с Моделью  
КАРРА Saphir**



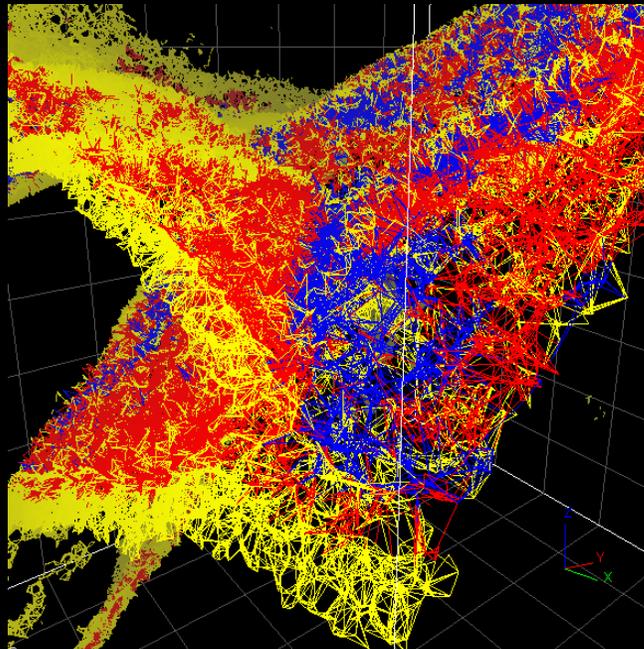
**Сейсмический  
Куб**



S. Vijay (2015)



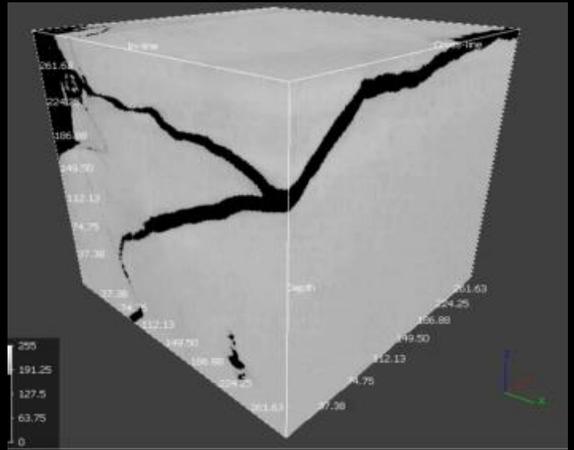
**Математическая Модель**



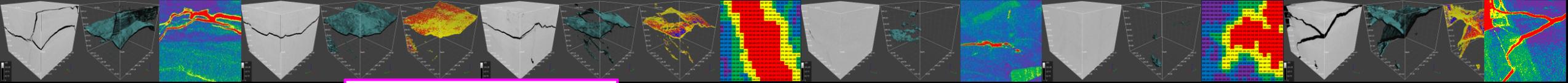
**Нейронная Сеть Построенная УММА**



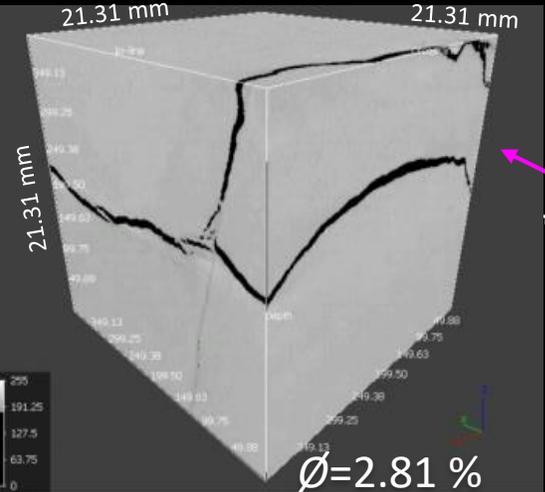
**Исходный фрагмент керна**



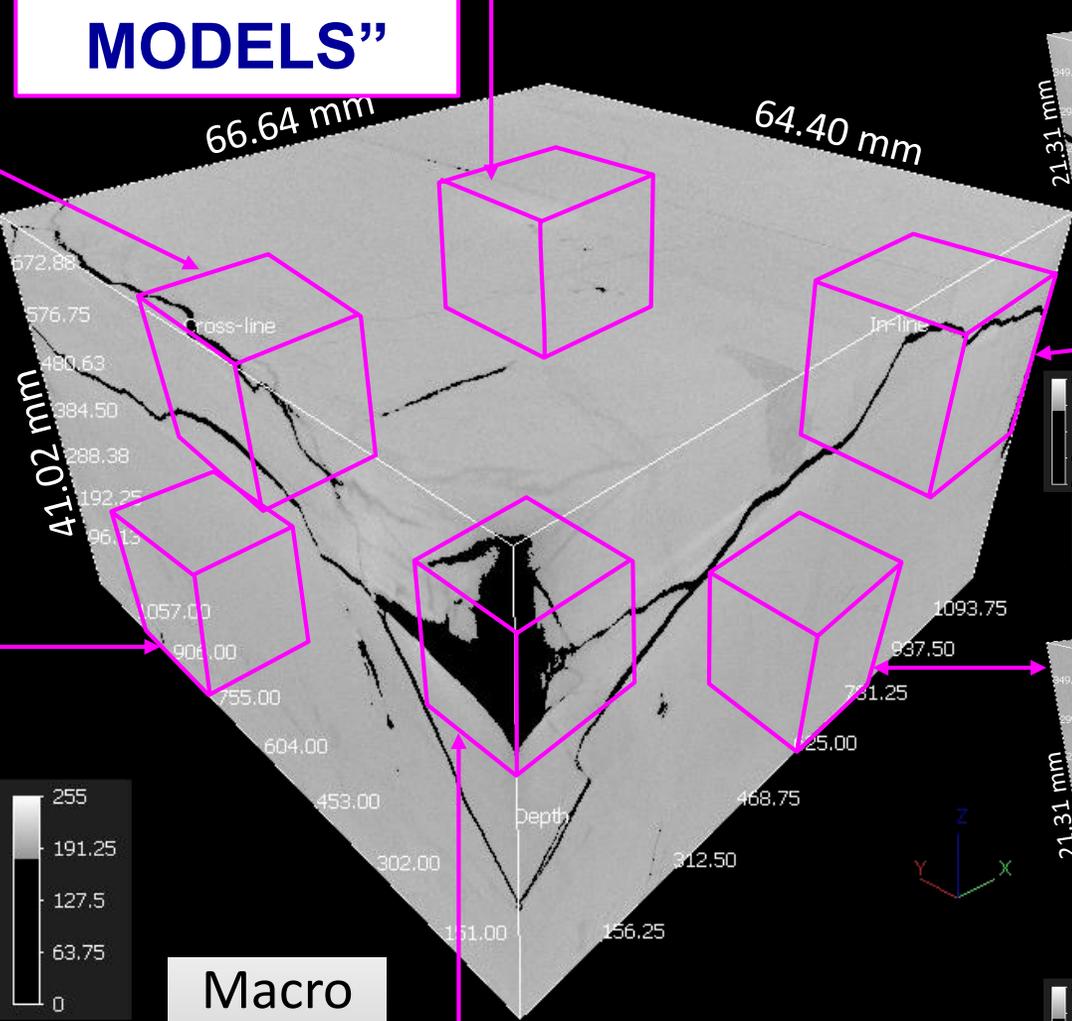
**Томографическое Изображение**



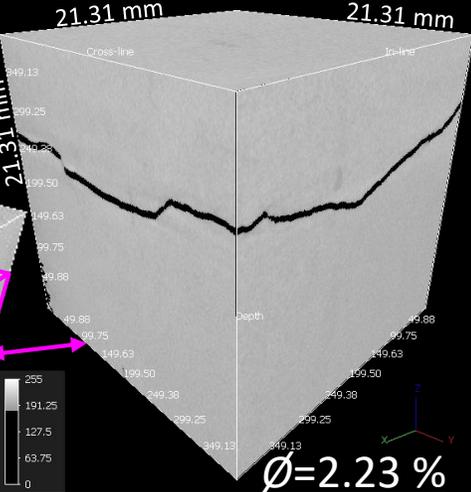
**“TOY  
MODELS”**



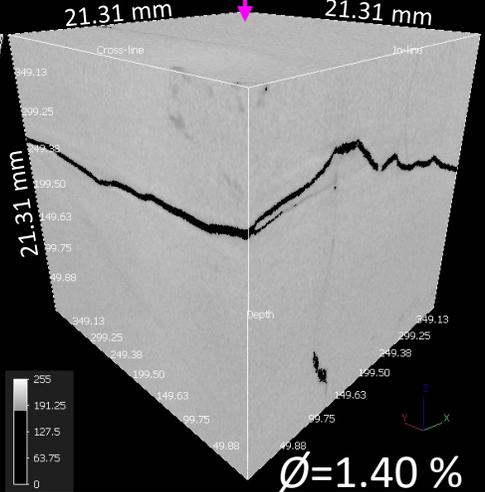
**Téxel-01 (5.50 %)**



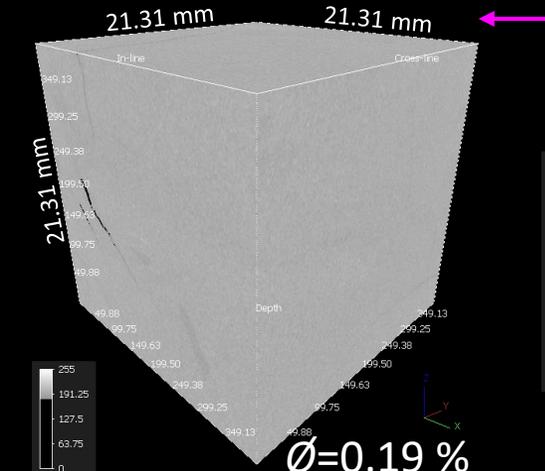
**Macro  
Téxel  
(100 %)**



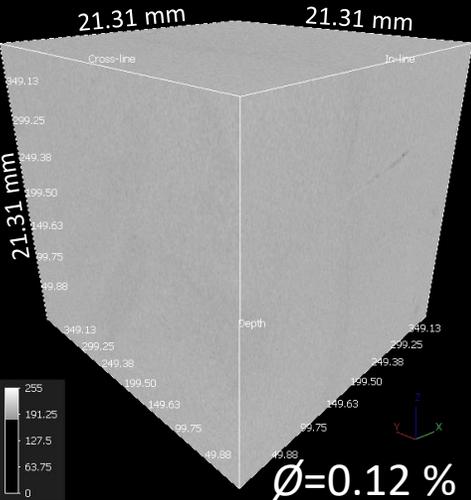
**Téxel-03 (5.50 %)**



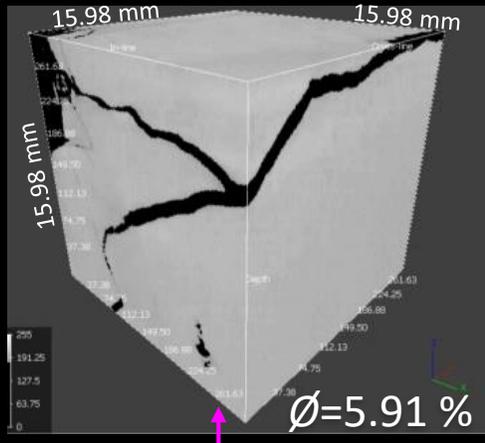
**Téxel-05 (5.50 %)**



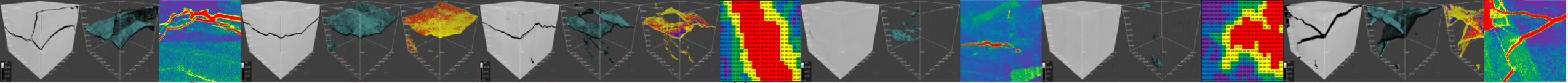
**Téxel-02 (5.50 %)**



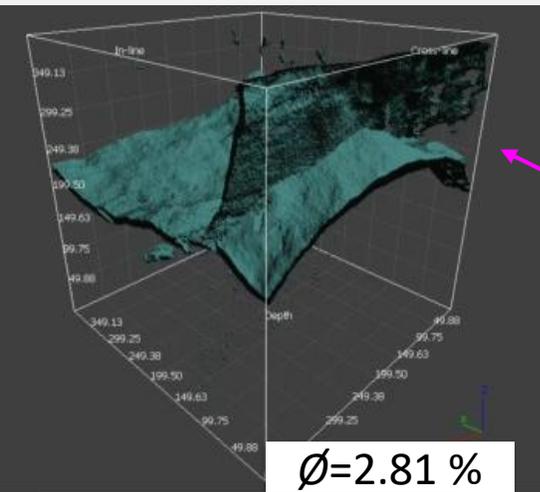
**Téxel-04 (5.50 %)**



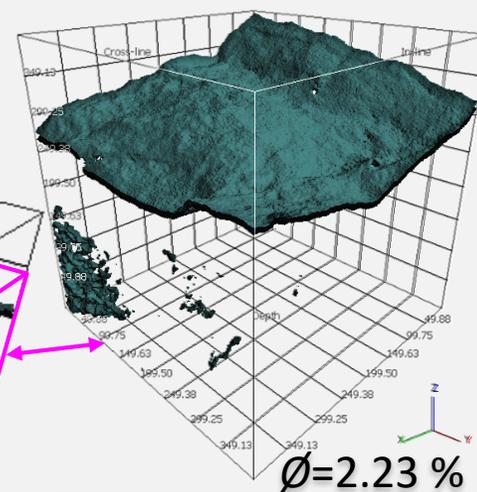
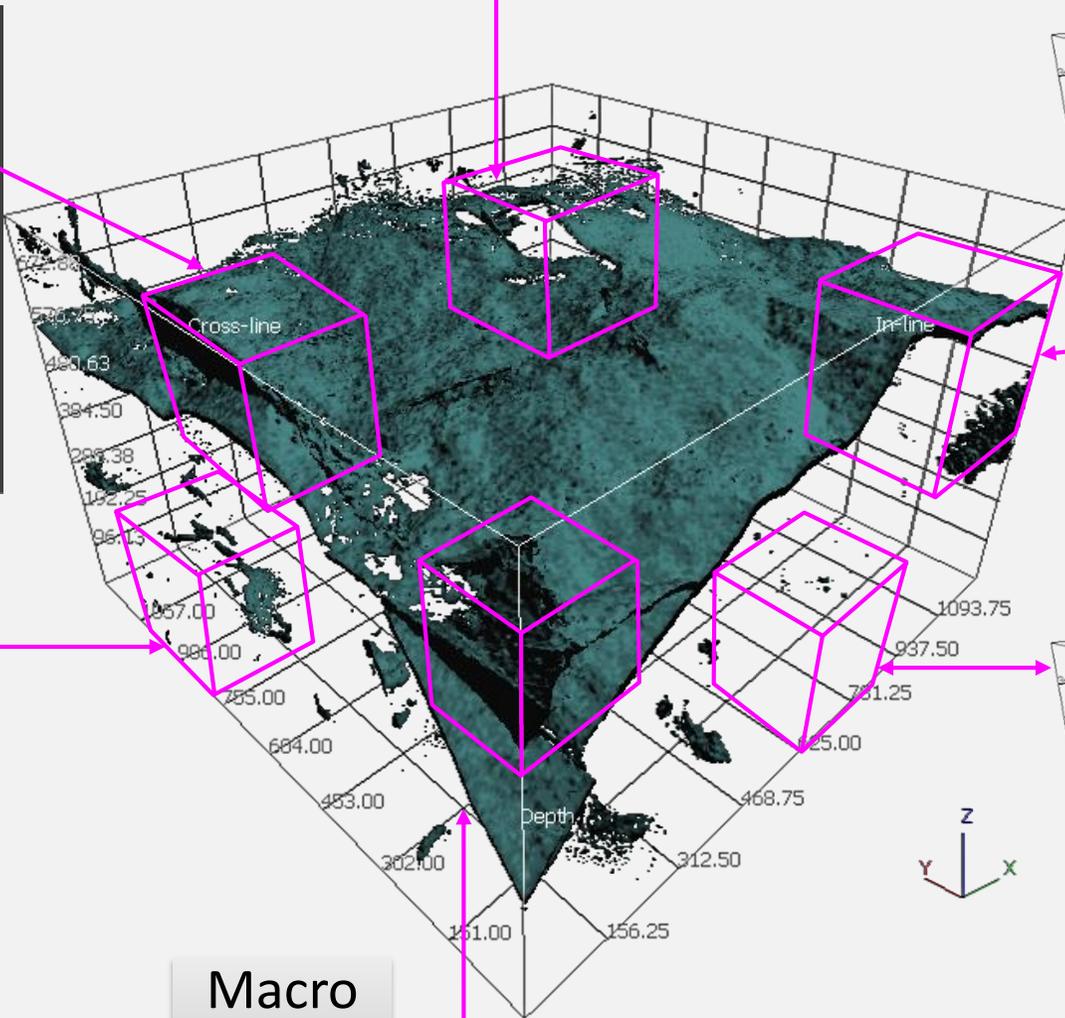
**Téxel-06 (2.32 %)**



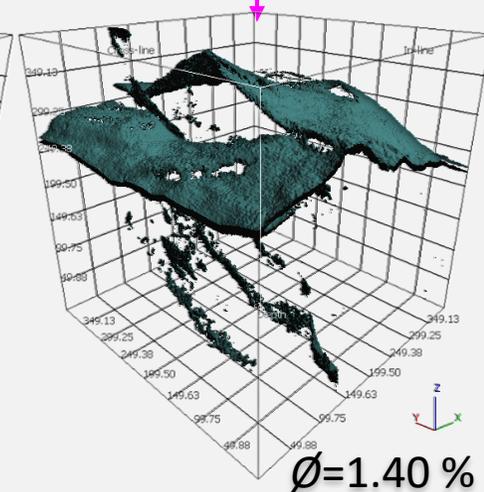
# Скелет Томографической Информации: Фации



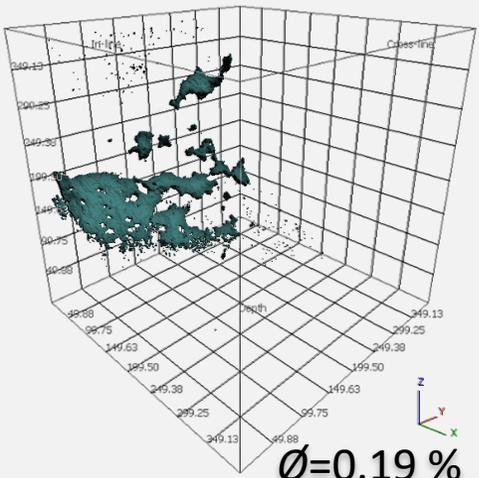
Texel-01 (5.50 %)



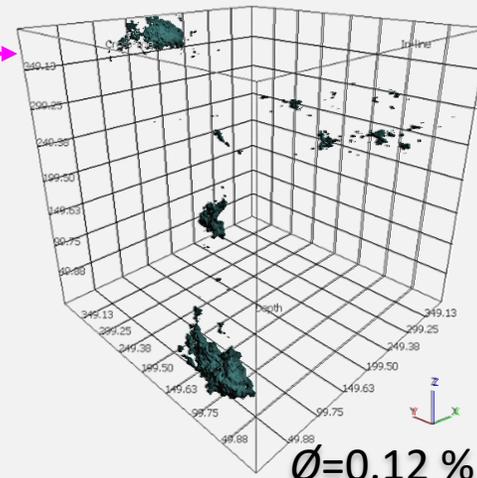
Texel-03 (5.50 %)



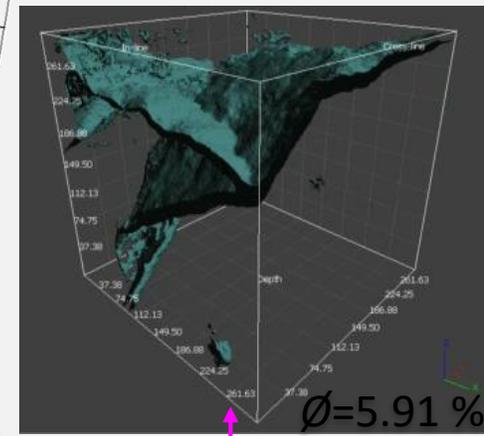
Texel-05 (5.50 %)



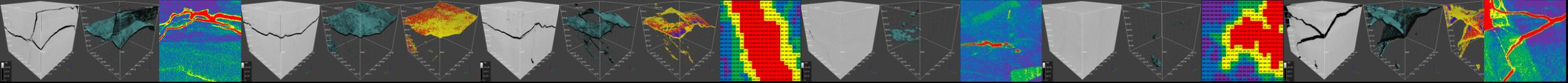
Texel-02 (5.50 %)



Texel-04 (5.50 %)

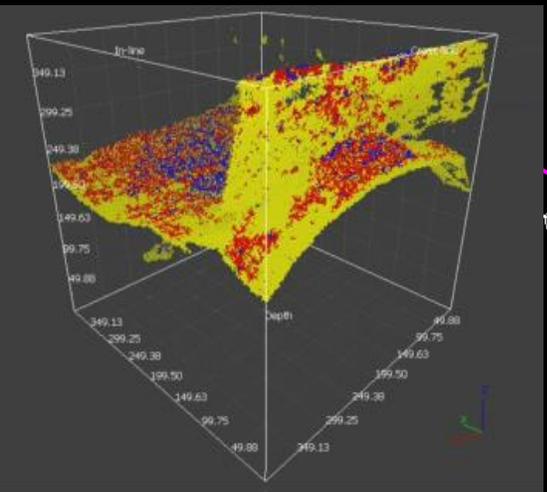


Texel-06 (2.32 %)

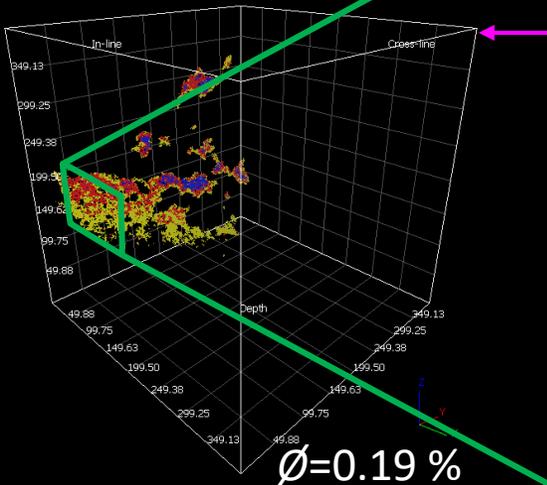
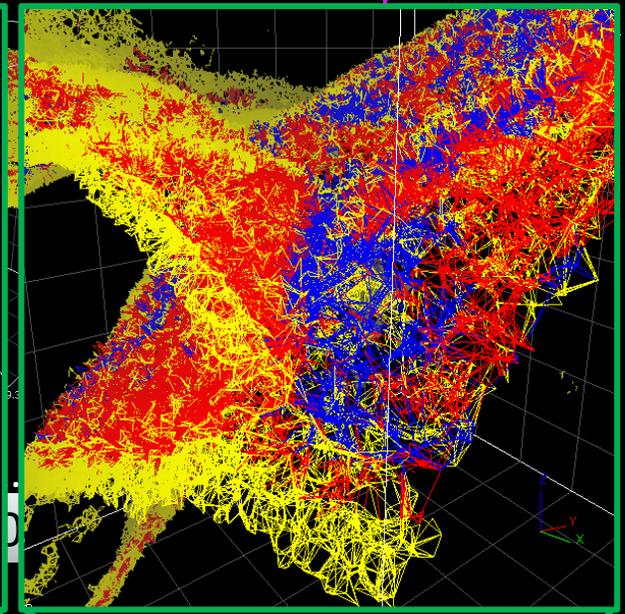
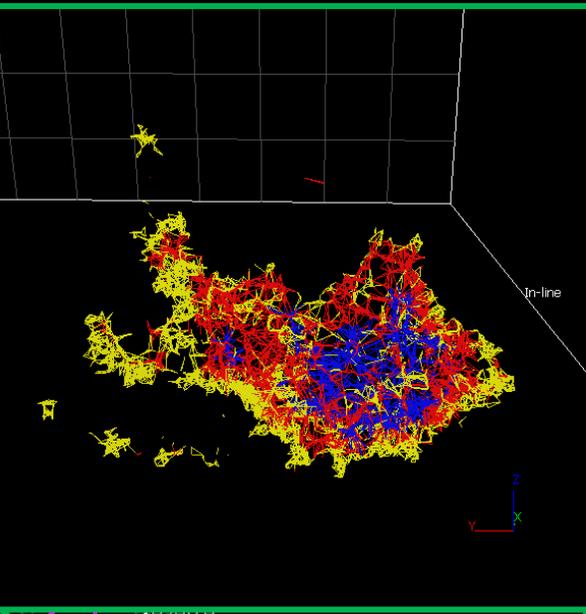
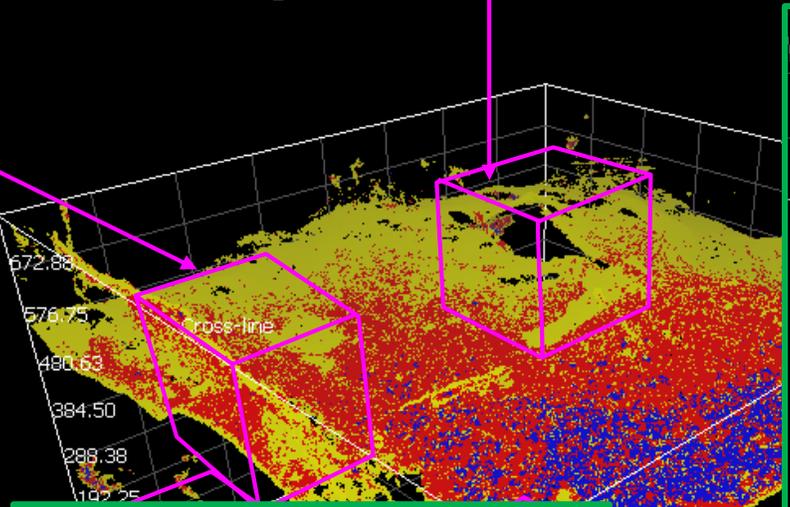


# Нейронные Сети

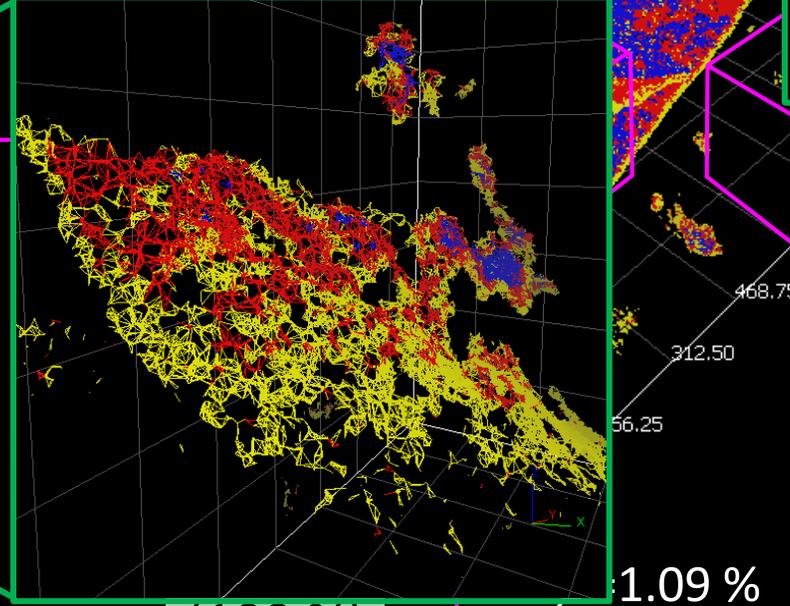
# Skeleton



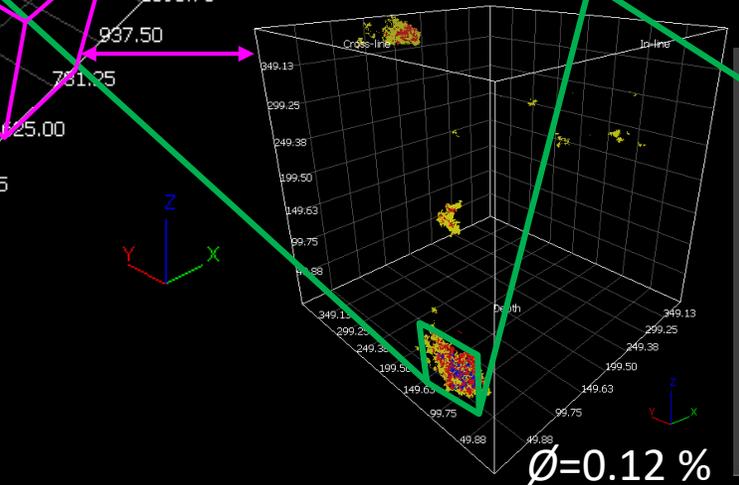
Texel-01 (5.50 %)



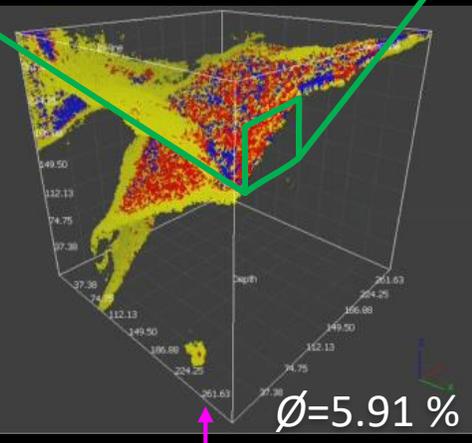
Texel-02 (5.50 %)



(100 %)



Texel-04 (5.50 %)



Texel-06 (2.32 %)

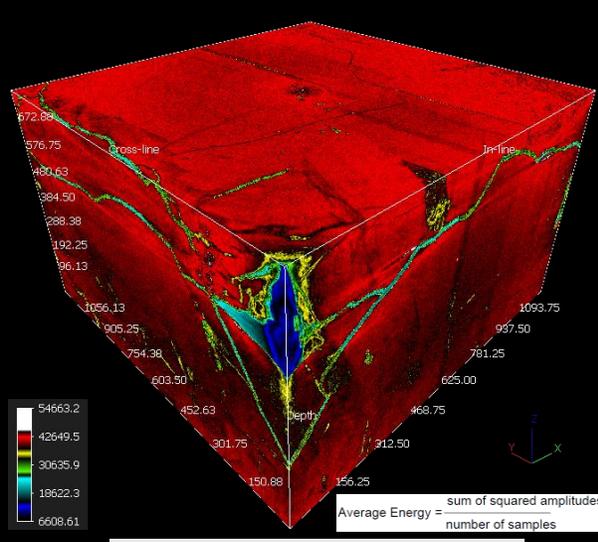
$\emptyset=0.19\%$

1.09 %

$\emptyset=0.12\%$

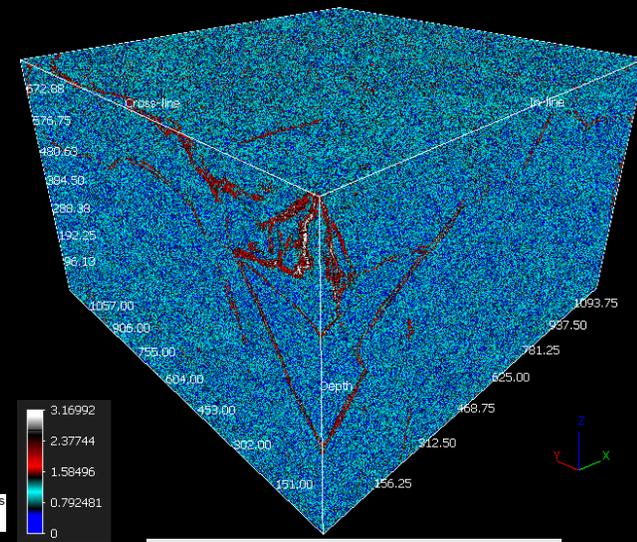
$\emptyset=5.91\%$

# Пример Статистических и Геостатистических Кубов (всего 25), которые строит програма для каждого куба

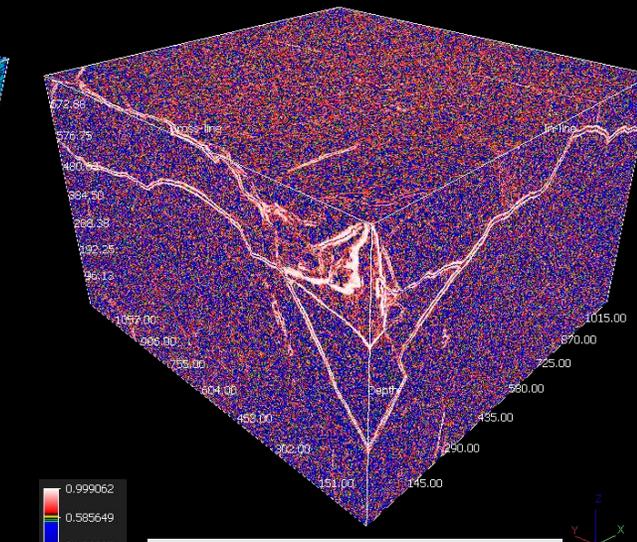


**AvgEnergy**

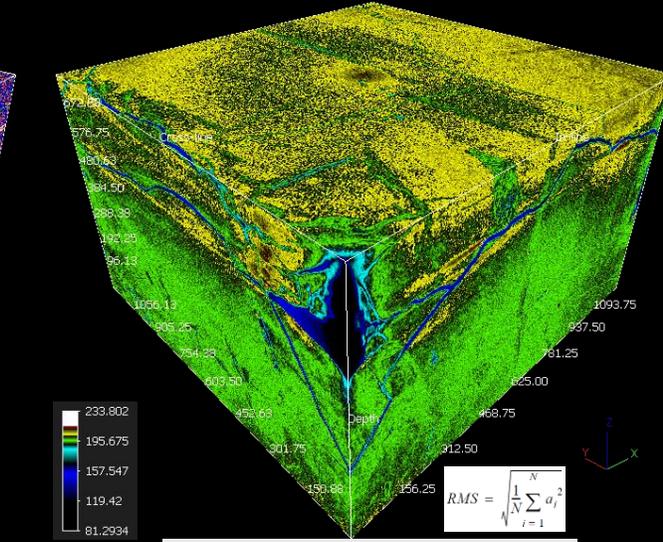
Average Energy =  $\frac{\text{sum of squared amplitudes}}{\text{number of samples}}$



**ENTROPY**

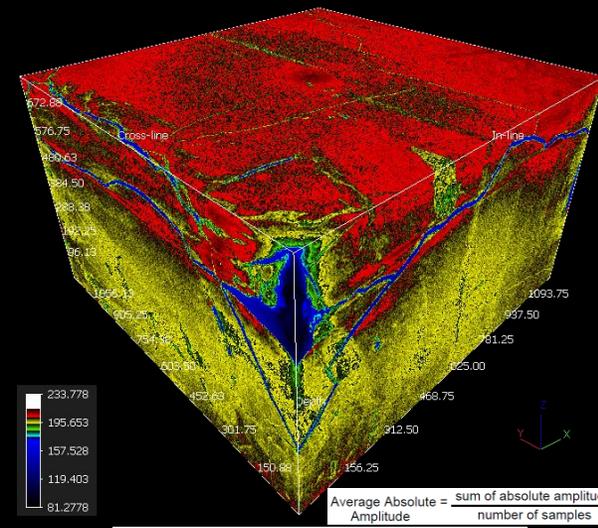


**CORRELATION**



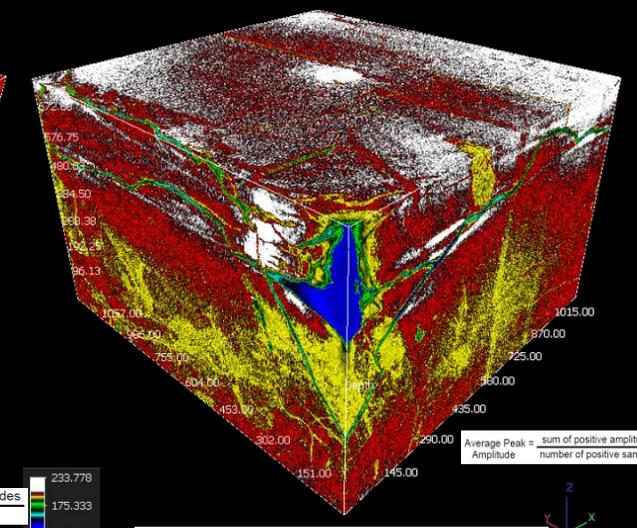
**RMS**

$$RMS = \sqrt{\frac{1}{N} \sum_{i=1}^N a_i^2}$$



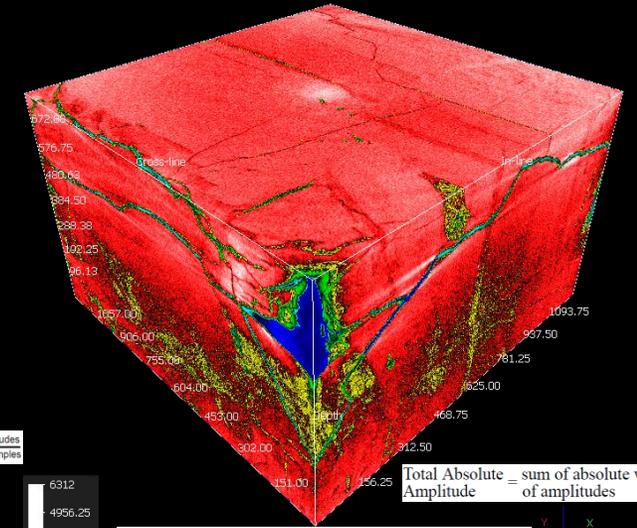
**AvgAbsAmp**

Average Absolute =  $\frac{\text{sum of absolute amplitudes}}{\text{number of samples}}$



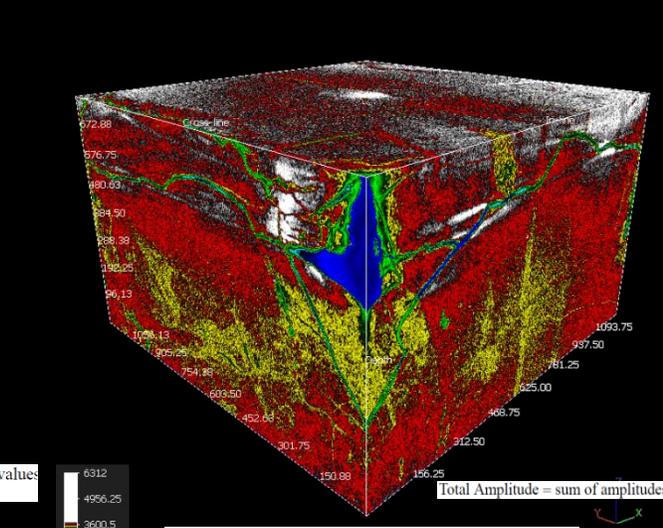
**AvgPeakAmp**

Average Peak =  $\frac{\text{sum of positive amplitudes}}{\text{number of positive samples}}$



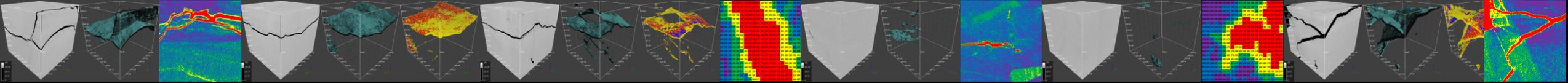
**TotAbsAmp**

Total Absolute Amplitude =  $\text{sum of absolute values of amplitudes}$



**TotAmp**

Total Amplitude =  $\text{sum of amplitudes}$



# Карта Трещин и Каверн

Excel window: Texel-03-Inline-375.xlsx - Excel

Archivo Inicio Insertar Diseño de página Fórmulas Datos Revisar Vista ¿Qué des

Formato condicional

Portapapeles

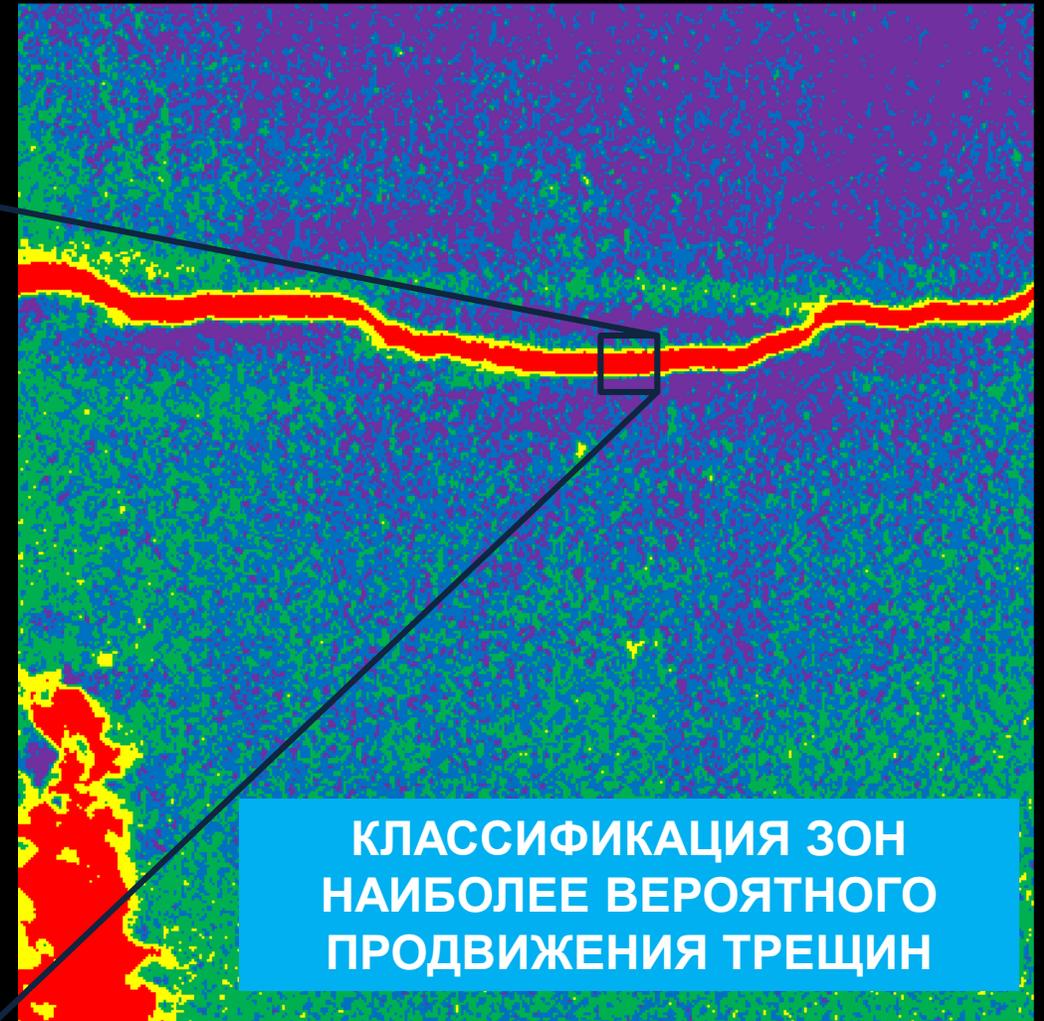
W27

	A	B	C	D
1	178.00	177.00	175.00	175.00
2	175.00	176.00	174.00	174.00
3	173.00	173.00	173.00	171.00
4	171.00	169.00	168.00	167.00
5	169.00	170.00	169.00	167.00
6	168.00	172.00	174.00	175.00
7	164.00	167.00	171.00	177.00
8	164.00	165.00	166.00	176.00
9	168.00	169.00	169.00	179.00
10	171.00	173.00	177.00	185.00
11	174.00	180.00	185.00	187.00
12	175.00	181.00	185.00	186.00
13	173.00	176.00	181.00	182.00
14	170.00	174.00	178.00	178.00
15	169.00	170.00	174.00	175.00
16	167.00	169.00	172.00	171.00

Texel-03-Inline-375

Listo

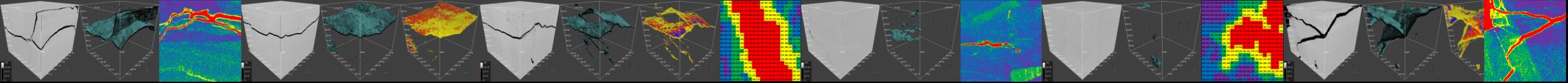
206	204	205	205	201	199	203	204	202	204	199	197	200	203	204	203	203	203	205	206
204	204	207	208	203	198	199	205	203	204	203	198	198	203	205	203	203	204	207	207
202	202	205	206	203	199	200	202	201	202	205	196	195	199	202	203	201	202	204	203
198	198	199	201	200	199	201	196	196	198	198	196	195	196	195	200	200	198	198	196
192	192	192	192	195	197	197	192	189	190	190	190	189	189	188	191	195	193	190	191
182	180	179	184	187	185	185	182	178	177	177	177	179	180	179	177	177	179	179	177
170	168	165	170	168	167	168	164	162	160	164	163	166	169	169	164	160	164	164	161
160	161	159	159	154	154	154	153	153	153	155	154	154	158	161	156	154	157	155	151
157	156	157	157	154	151	146	149	154	152	151	149	149	155	157	151	152	157	154	152
156	154	156	156	153	149	147	150	155	151	149	150	152	155	154	151	150	156	154	154
158	155	154	156	153	149	153	156	157	151	151	157	158	155	155	153	150	154	154	154
158	156	157	159	158	154	158	161	162	159	158	160	161	156	155	155	155	153	154	158
163	161	164	164	162	160	162	164	164	166	164	165	164	161	160	161	164	163	163	166
174	170	175	174	171	170	171	172	173	176	175	175	175	176	177	176	177	177	182	183
188	185	187	186	187	186	188	186	187	189	189	193	194	192	191	192	193	197	199	
199	199	198	198	198	199	202	198	199	200	199	202	203	204	203	203	203	206	207	206
205	206	205	205	204	204	205	203	204	205	205	207	207	208	209	208	209	211	211	206
208	206	207	207	207	206	205	205	207	205	206	209	212	211	210	210	210	210	209	204
207	204	206	207	208	206	205	207	206	206	207	208	213	209	206	208	208	209	210	207
206	206	208	207	206	205	204	206	205	206	207	207	211	208	206	208	209	210	210	209



**КЛАССИФИКАЦИЯ ЗОН  
НАИБОЛЕЕ ВЕРОЯТНОГО  
ПРОДВИЖЕНИЯ ТРЕЩИН**



**Texel-03  
Inline-375**

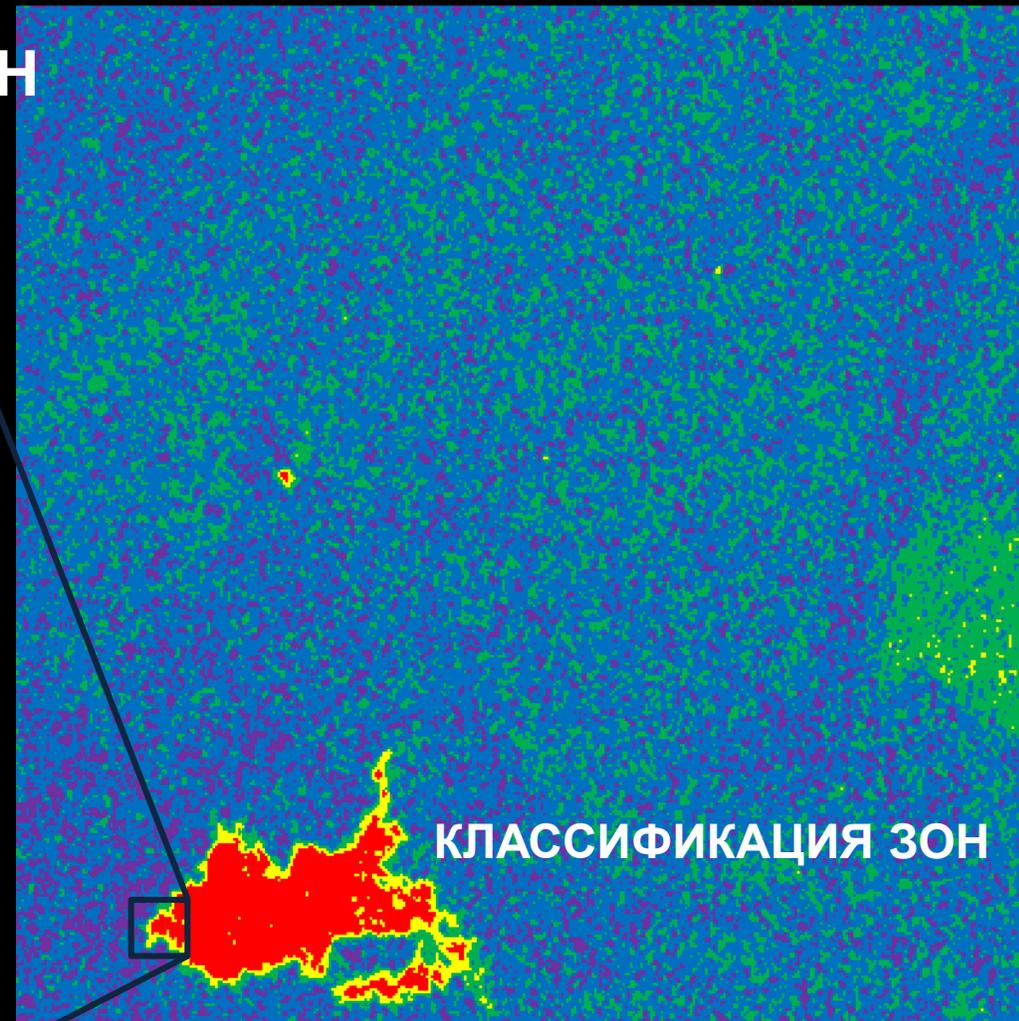


# КАРТЫ КАВЕРН

Excel interface showing the 'Inicio' tab and 'Formato condicional' dropdown menu. The spreadsheet data is as follows:

	A	B	C	D
1	201.00	200.00	199.00	198.00
2	201.00	202.00	201.00	200.00
3	201.00	203.00	203.00	200.00
4	203.00	205.00	201.00	199.00
5	202.00	203.00	199.00	198.00
6	197.00	197.00	200.00	202.00
7	199.00	198.00	201.00	200.00
8	200.00	198.00	198.00	195.00
9	197.00	197.00	198.00	195.00
10	198.00	199.00	198.00	196.00
11	199.00	199.00	195.00	194.00
12	200.00	197.00	195.00	195.00
13	199.00	196.00	195.00	197.00
14	199.00	199.00	198.00	197.00
15	199.00	201.00	198.00	194.00
16	197.00	200.00	198.00	195.00

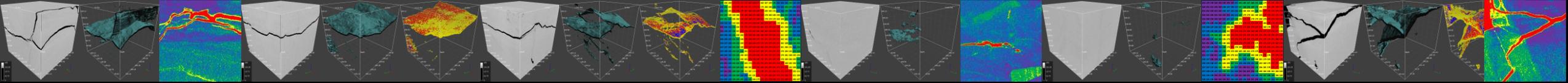
204	199	199	200	200	199	199	199	197	193	189	187	188	191	188	179	175	175	173	172
206	203	201	200	200	198	197	198	197	191	188	188	189	191	186	178	176	176	174	170
203	204	203	203	202	198	197	196	196	188	184	184	186	188	184	177	175	174	173	169
200	202	205	205	205	202	200	196	194	187	179	179	181	185	183	177	174	172	171	170
199	200	203	200	204	202	197	194	190	183	175	175	178	179	180	178	174	173	173	174
199	196	199	198	200	196	190	187	182	178	173	172	174	174	177	180	176	174	175	177
198	196	197	198	197	193	186	181	175	173	171	168	170	170	174	180	178	176	177	178
197	198	195	196	195	190	182	177	173	174	173	169	169	169	173	177	177	176	177	178
198	198	193	190	189	186	180	176	176	172	173	170	171	171	171	174	175	175	175	175
199	199	197	192	188	185	179	175	176	171	170	169	173	174	171	172	173	171	169	172
202	201	200	198	193	186	180	174	175	173	170	170	175	179	175	173	173	170	167	172
203	199	198	200	198	188	179	175	178	180	177	175	177	179	175	171	173	172	170	172
201	197	197	200	197	188	179	178	180	185	185	181	179	179	173	172	176	175	172	171
201	197	200	201	198	189	180	178	181	187	189	188	185	183	178	176	178	172	170	172
198	197	200	199	195	186	178	181	185	191	194	193	189	186	181	179	181	175	172	176
196	196	198	197	191	183	180	187	191	196	198	198	194	189	183	180	179	177	175	179
197	197	197	196	191	185	186	193	197	201	200	201	199	192	186	181	178	177	177	182
197	198	198	197	196	192	192	194	198	202	201	202	200	192	186	184	183	182	180	184
196	196	198	200	202	199	196	195	199	201	200	201	198	196	190	187	188	189	186	184
198	194	196	200	204	204	201	198	198	199	198	199	201	200	194	191	192	194	190	187



# КЛАССИФИКАЦИЯ ЗОН



Texel-04  
Inline-43



# Карта Системы Трещин

Excel window: Texel-01-Inline-50.xlsx - Excel

Archivo Inicio Insertar Diseño de página Fórmulas Datos Revisar Vista ¿Qué des

Formato condicional

Portapapeles

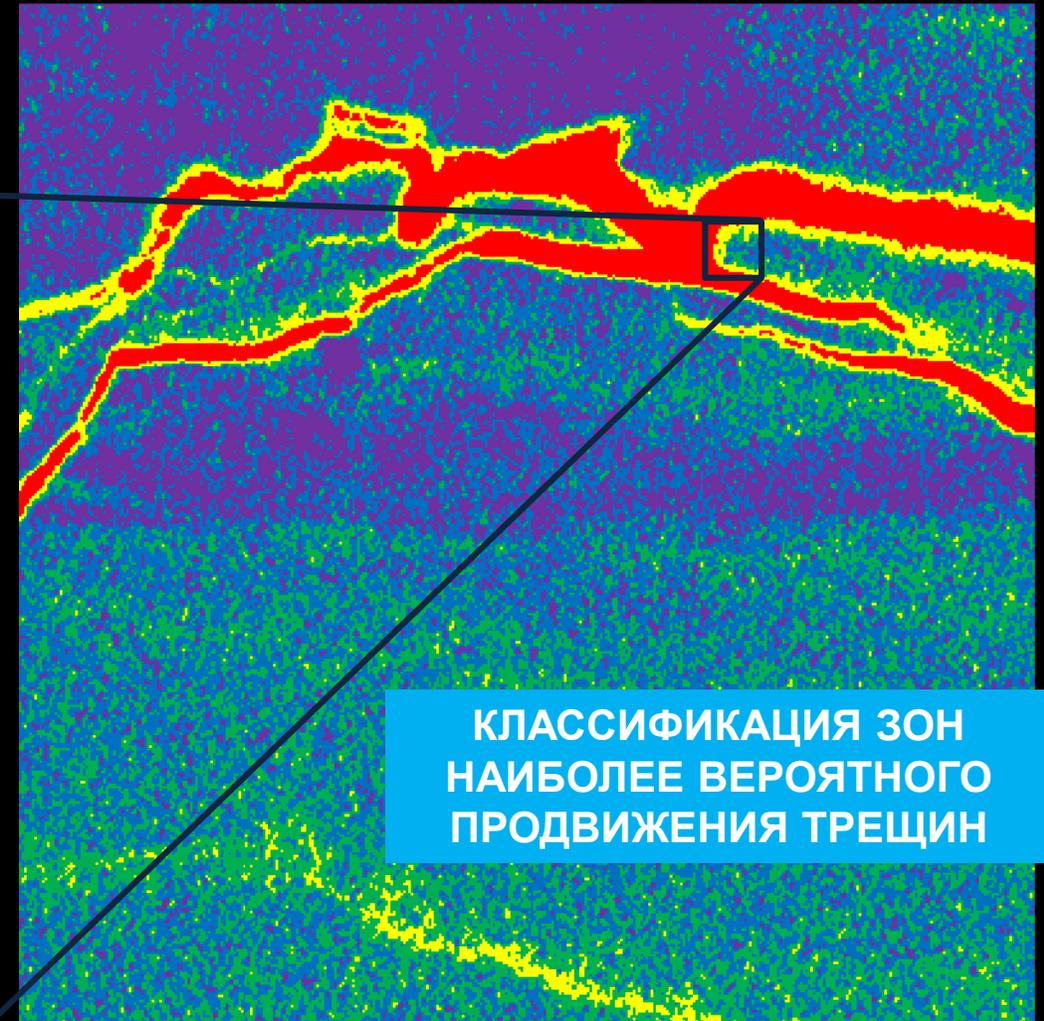
M32

	A	B	C	D
1	195.00	194.00	195.00	197.00
2	196.00	199.00	198.00	195.00
3	197.00	197.00	196.00	196.00
4	200.00	196.00	194.00	194.00
5	201.00	196.00	194.00	196.00
6	198.00	193.00	193.00	197.00
7	199.00	196.00	195.00	196.00
8	202.00	198.00	197.00	198.00
9	198.00	197.00	198.00	198.00
10	194.00	197.00	198.00	197.00
11	197.00	198.00	198.00	195.00
12	196.00	196.00	195.00	196.00
13	197.00	195.00	196.00	197.00
14	199.00	198.00	196.00	195.00
15	198.00	199.00	197.00	198.00
16	194.00	195.00	194.00	196.00

Texel-01-Inline-50

Listo

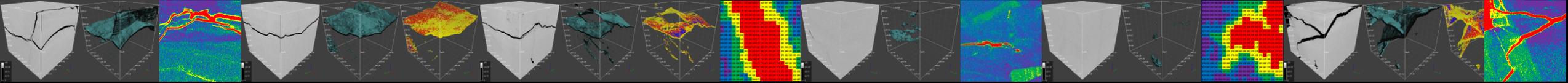
163	164	164	169	174	176	175	175	178	180	179	177	183	189	183	179	181	182	184	181
166	166	166	169	175	179	179	180	183	184	182	183	189	193	190	186	184	185	189	185
166	166	169	173	178	182	181	183	188	188	187	189	195	195	190	189	188	188	189	186
165	165	171	176	182	184	185	185	190	189	190	190	194	194	189	189	191	192	190	188
165	163	169	179	185	187	187	186	190	192	193	192	192	193	189	191	194	193	192	193
165	166	169	179	184	187	189	189	191	196	197	194	192	194	188	189	194	197	194	193
167	171	171	176	184	189	190	191	193	197	197	196	193	194	191	190	197	197	196	199
165	173	177	177	185	190	192	193	194	194	197	198	194	195	197	194	197	193	196	201
162	175	181	178	185	188	190	195	198	196	197	196	197	199	199	194	193	196	200	200
162	173	182	184	188	185	188	197	199	198	199	197	200	201	197	197	198	197	199	199
164	171	180	186	192	187	187	197	199	197	198	197	198	198	194	197	202	199	198	197
166	172	178	186	192	190	188	196	196	195	197	195	194	195	193	195	203	203	200	199
168	173	179	186	191	190	190	196	197	195	195	193	193	198	199	197	200	200	199	200
167	173	179	187	190	190	190	194	197	199	198	195	194	194	198	202	198	197	198	199
165	169	177	185	188	190	198	202	200	196	192	194	195	196	198	198	198	197	199	199
159	165	173	181	185	188	193	197	196	193	190	193	195	195	194	198	198	196	198	198
156	162	168	175	178	182	187	188	191	190	189	192	194	193	194	196	195	195	198	196
156	161	164	168	171	174	179	180	187	187	185	187	189	190	191	193	193	196	198	194
156	156	160	163	165	164	169	172	178	182	181	182	183	186	186	187	189	191	194	190
154	154	156	159	159	160	164	167	169	172	176	177	175	176	179	182	183	185	189	187



**КЛАССИФИКАЦИЯ ЗОН  
НАИБОЛЕЕ ВЕРОЯТНОГО  
ПРОДВИЖЕНИЯ ТРЕЩИН**



**Téxel-01  
Inline-50**



# Карта Системы связанных Трещин

Excel window: Texel-05-Crossline-398.xlsx - Excel

Archivo Inicio Insertar Diseño de página Fórmulas Datos Revisar Vista ¿Qué des

Formato condicional

Portapapeles

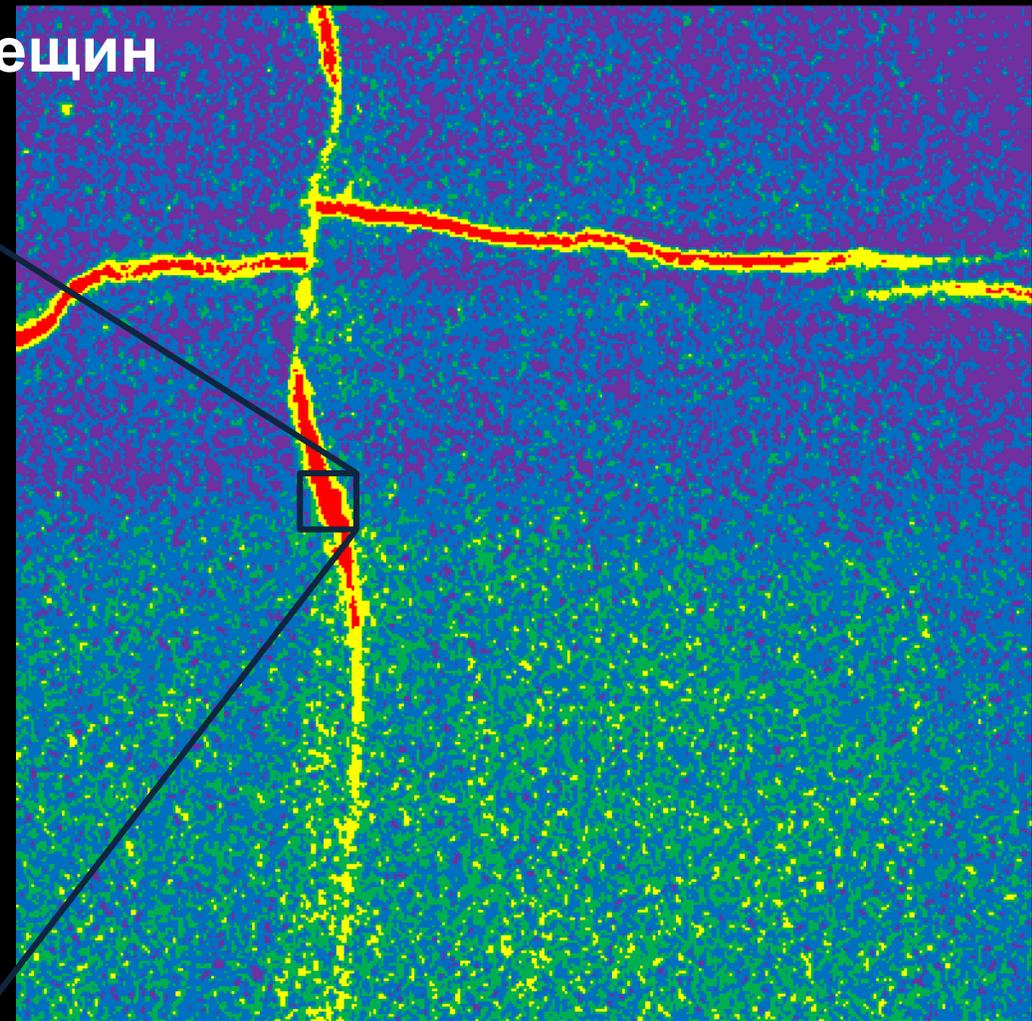
W26

	A	B	C	D
1	193.00	192.00	194.00	196.00
2	195.00	194.00	197.00	196.00
3	197.00	197.00	197.00	197.00
4	197.00	199.00	198.00	199.00
5	196.00	199.00	202.00	202.00
6	197.00	197.00	199.00	199.00
7	195.00	192.00	194.00	196.00
8	194.00	192.00	196.00	198.00
9	195.00	195.00	198.00	198.00
10	196.00	195.00	194.00	195.00
11	198.00	195.00	193.00	195.00
12	199.00	196.00	197.00	199.00
13	197.00	198.00	200.00	199.00
14	194.00	196.00	197.00	195.00
15	192.00	193.00	194.00	194.00
16	193.00	191.00	192.00	194.00

Texel-05-Crossline-398

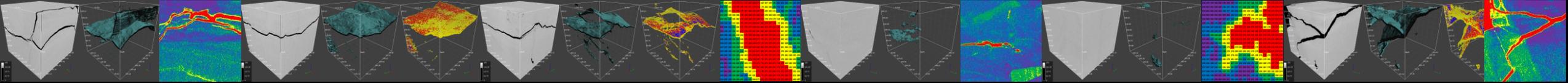
Listo

195	188	180	174	173	171	172	169	168	173	182	187	189	195	200	200	196	194	196	200
198	192	181	174	172	170	171	171	170	173	179	186	188	195	199	196	193	194	196	201
196	194	185	176	174	170	167	168	169	169	172	180	183	191	197	196	195	196	198	201
194	193	189	180	180	174	169	168	171	168	169	178	180	183	190	194	195	198	200	201
195	195	193	185	183	176	170	169	171	168	171	178	178	179	183	188	192	197	201	199
199	199	197	190	183	175	173	173	168	164	168	174	177	176	178	183	191	197	201	199
202	200	198	194	184	175	175	175	168	162	164	170	173	174	176	181	188	195	198	196
201	198	197	194	187	177	174	172	167	165	166	169	170	170	174	181	187	193	197	196
200	198	196	194	190	182	172	168	165	168	168	170	170	169	173	182	189	194	196	196
200	198	198	194	192	186	175	168	169	173	171	171	172	170	173	182	191	196	195	195
199	197	198	194	192	189	177	168	168	173	171	170	174	173	175	182	188	193	194	195
197	197	198	195	193	189	177	169	164	168	169	170	174	173	177	181	186	191	196	195
197	199	196	194	195	192	181	172	167	167	169	172	174	172	177	179	184	191	193	192
200	200	196	192	193	190	183	174	169	168	171	174	172	171	175	179	181	188	190	190
201	201	199	194	193	190	181	175	168	169	172	171	171	170	172	178	180	186	190	193
200	201	199	195	195	192	183	178	171	171	171	173	174	171	173	177	180	185	190	194
198	201	200	194	194	192	186	182	177	172	169	172	174	171	173	174	176	183	188	193
197	201	201	194	194	194	191	187	179	172	170	171	171	168	171	172	170	177	185	191
199	201	198	193	194	196	196	191	181	175	175	171	168	167	172	172	168	172	181	189
199	200	196	194	194	195	198	193	184	179	176	172	170	169	173	172	169	172	180	187



Téxel-05  
Crossline-398



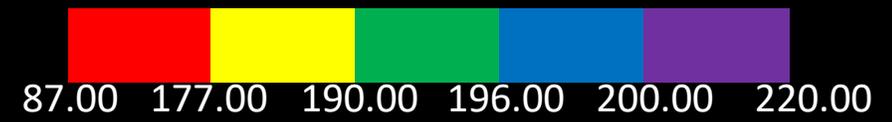
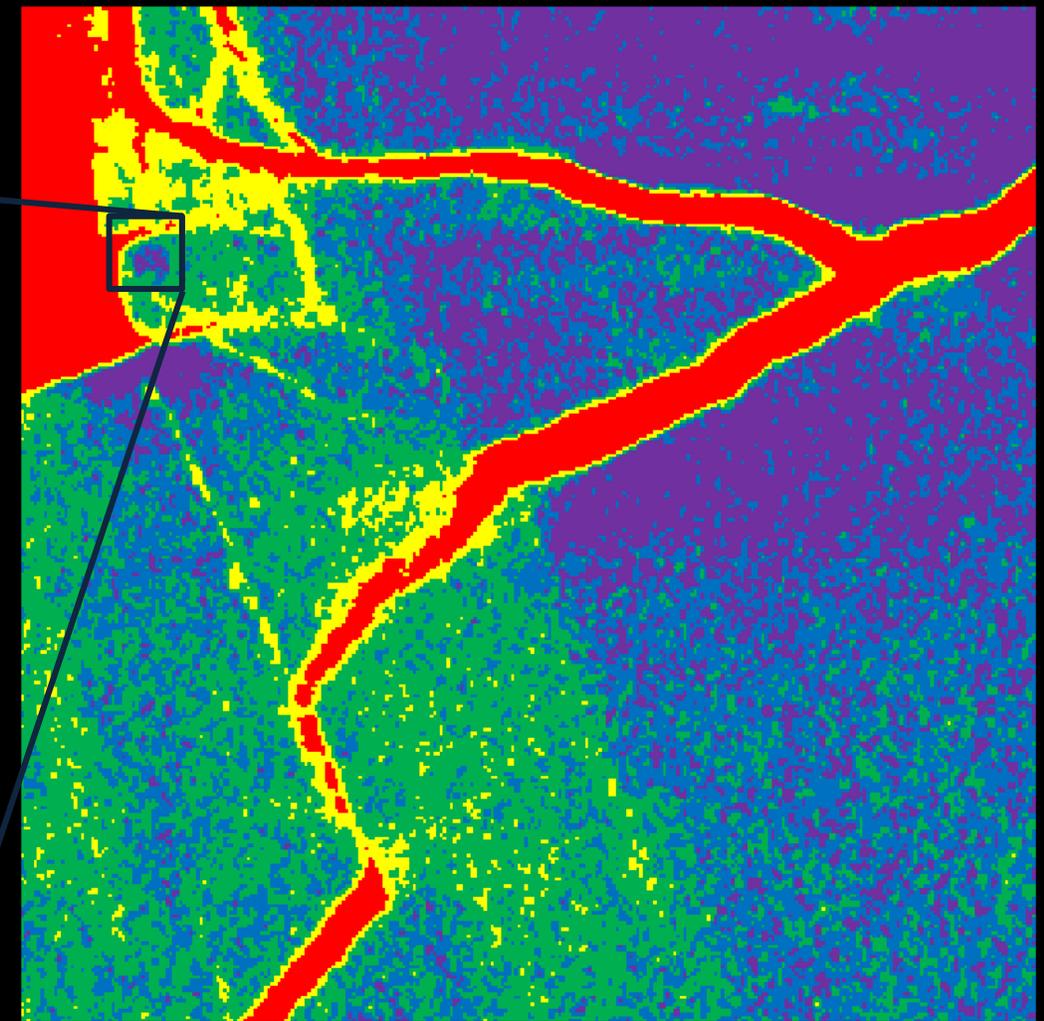


# Карты Зон Сложной Пористости

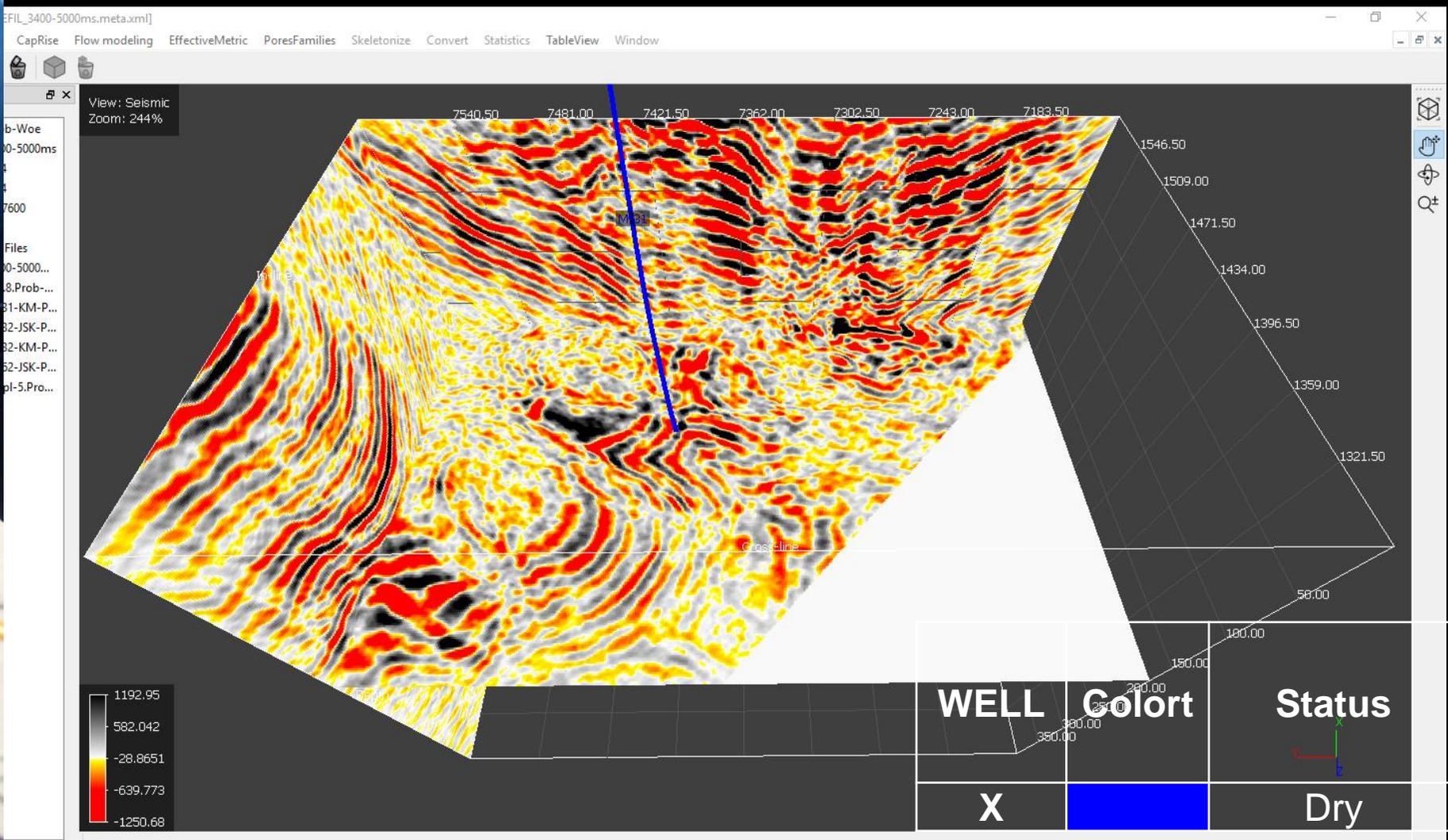
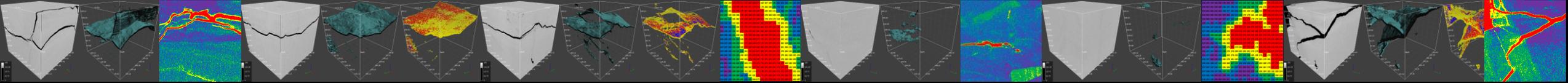
Excel interface showing the file 'Texel-06-Crossline-25.xlsx' and the 'Inicio' ribbon. The spreadsheet data is as follows:

	A	B	C	D
1	195.00	194.00	190.00	190.00
2	194.00	195.00	193.00	192.00
3	190.00	192.00	191.00	190.00
4	191.00	194.00	194.00	192.00
5	194.00	196.00	197.00	196.00
6	197.00	195.00	196.00	200.00
7	196.00	195.00	193.00	197.00
8	193.00	192.00	193.00	196.00
9	195.00	193.00	196.00	198.00
10	199.00	198.00	200.00	202.00
11	199.00	198.00	197.00	197.00
12	197.00	197.00	196.00	194.00
13	196.00	197.00	196.00	194.00
14	194.00	196.00	194.00	193.00
15	195.00	197.00	196.00	195.00
16	195.00	195.00	196.00	195.00

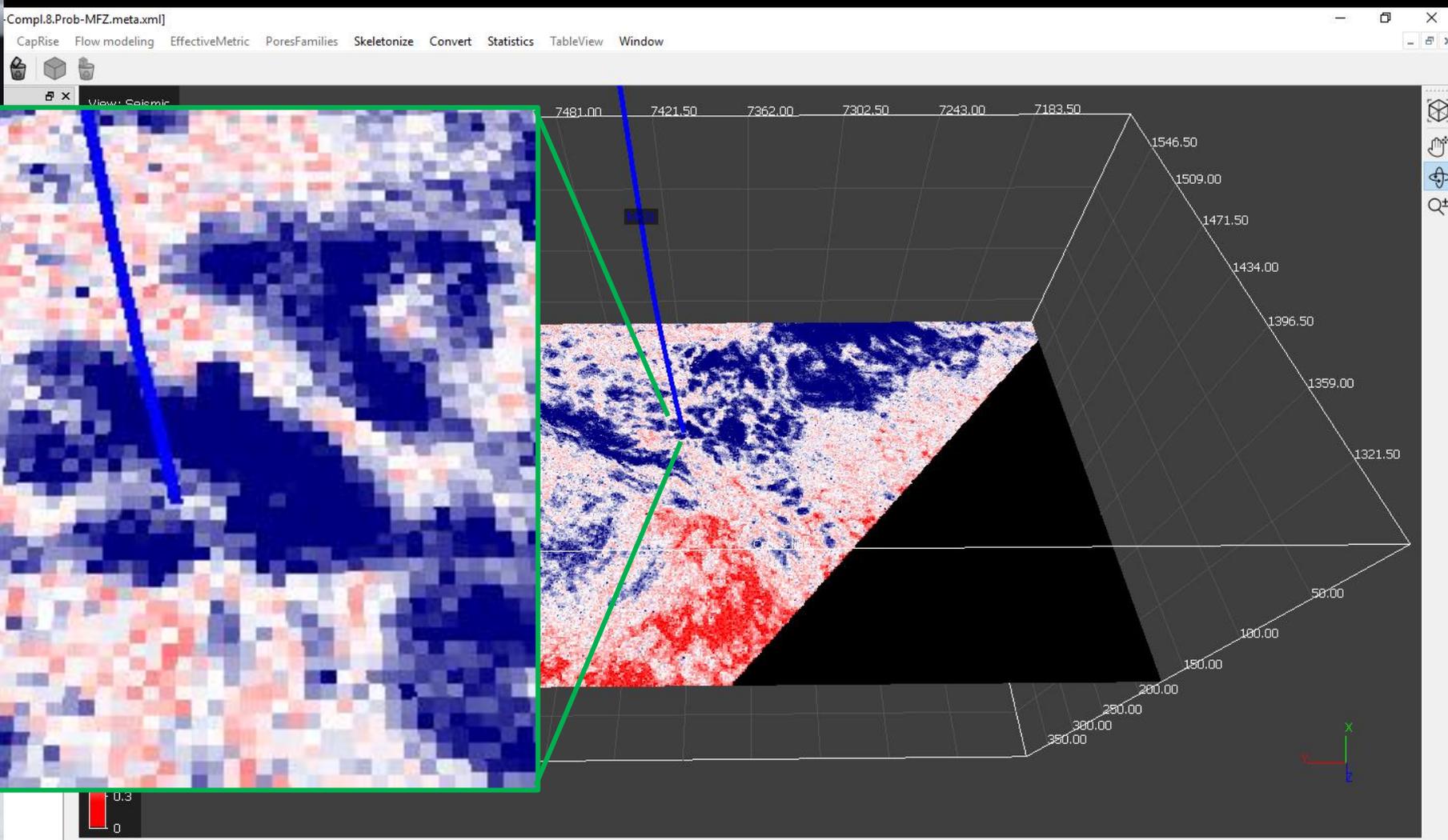
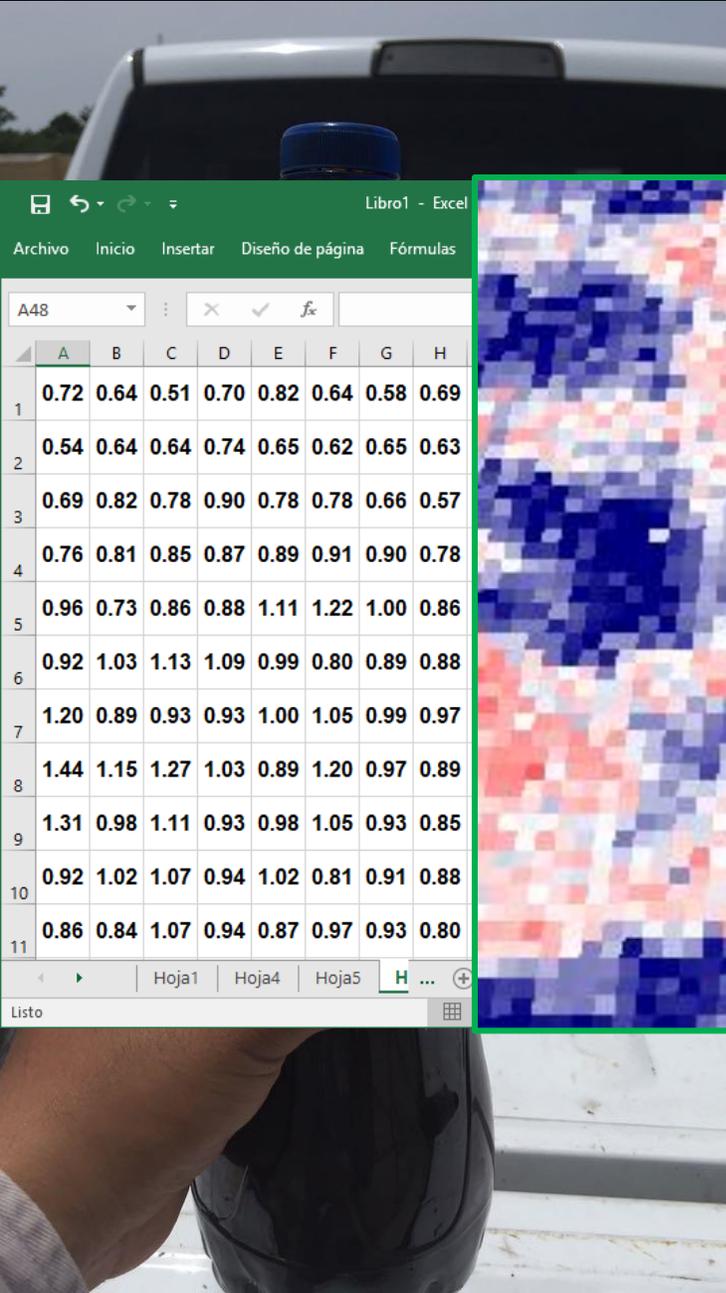
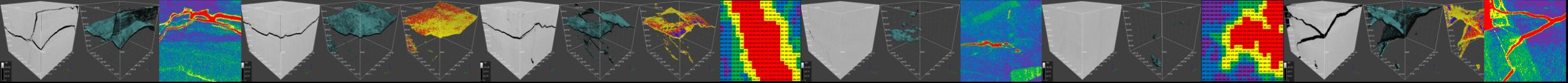
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195	194	190	190	192	187	181	184	182	178	180	183	184	186	186	182	176	175	176	178
190	191	189	189	187	182	179	179	176	174	180	182	183	184	183	182	176	178	183	185
184	185	183	181	178	175	174	175	174	172	175	177	180	183	184	186	184	185	189	189
175	175	174	172	171	171	172	176	178	177	178	182	185	189	191	192	191	191	193	193
167	167	166	168	171	171	173	181	186	187	187	191	193	197	196	194	194	194	197	195
161	163	163	170	176	180	183	189	191	193	196	197	196	196	195	195	194	194	197	195
155	160	166	177	183	189	192	194	196	197	200	199	198	197	197	196	194	193	195	194
153	162	174	184	189	194	194	195	197	200	203	199	199	199	201	198	195	194	195	193
153	165	178	190	195	197	196	197	198	200	203	201	201	202	201	198	197	196	196	193
154	168	181	190	195	197	200	202	202	200	201	200	203	205	199	198	198	196	194	192
157	172	181	189	193	195	200	203	202	201	200	197	201	202	201	202	198	195	192	192
162	177	183	189	193	195	198	203	201	202	202	198	200	201	205	206	199	195	192	192
161	177	184	193	195	195	197	204	200	201	202	201	203	201	203	204	202	196	192	191
163	176	184	192	193	191	195	201	202	201	199	199	201	199	200	201	201	196	195	194
163	175	184	190	190	189	192	198	202	199	195	193	195	198	202	200	198	194	195	197
163	175	182	189	191	189	191	197	200	196	194	191	195	199	202	198	196	194	194	196
159	173	185	191	192	192	193	195	196	195	195	193	196	199	200	197	195	195	195	196
156	172	185	192	192	194	196	193	192	194	193	193	197	197	197	195	196	196	196	195
156	173	186	192	191	193	196	193	192	194	194	192	194	194	193	193	195	196	195	194



Texel-06  
Crossline-25



Сейсмика



Libro1 - Excel

Archivo Inicio Insertar Diseño de página Fórmulas

A48

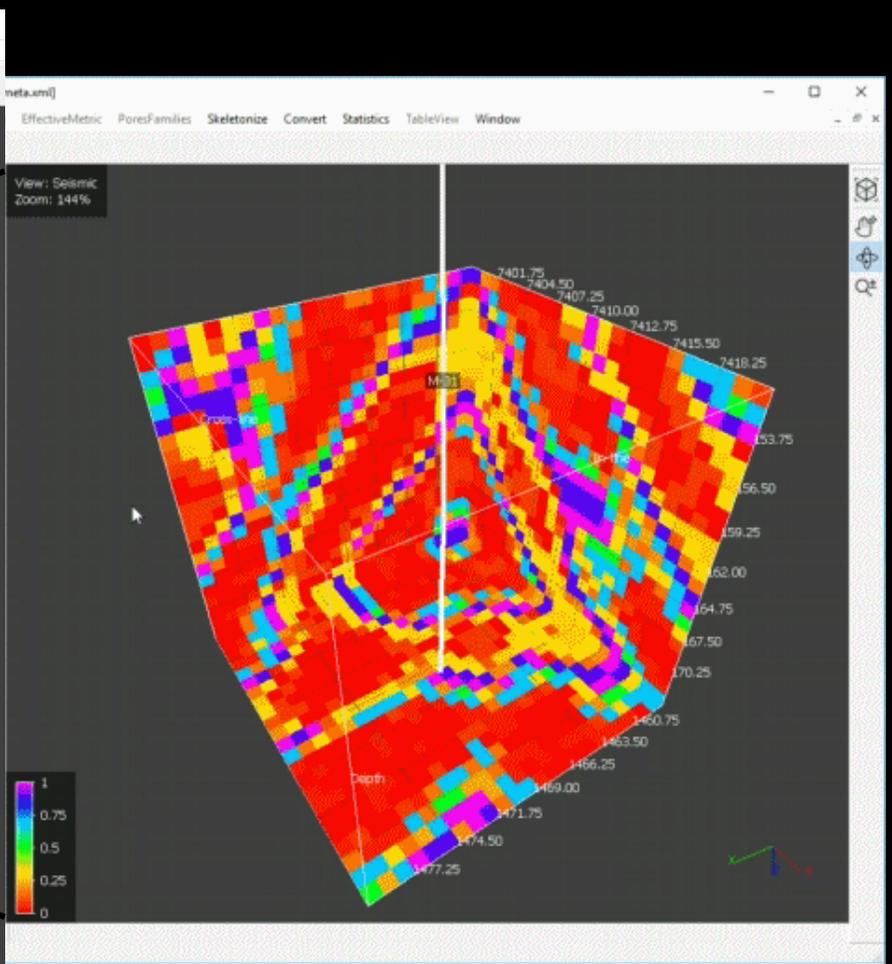
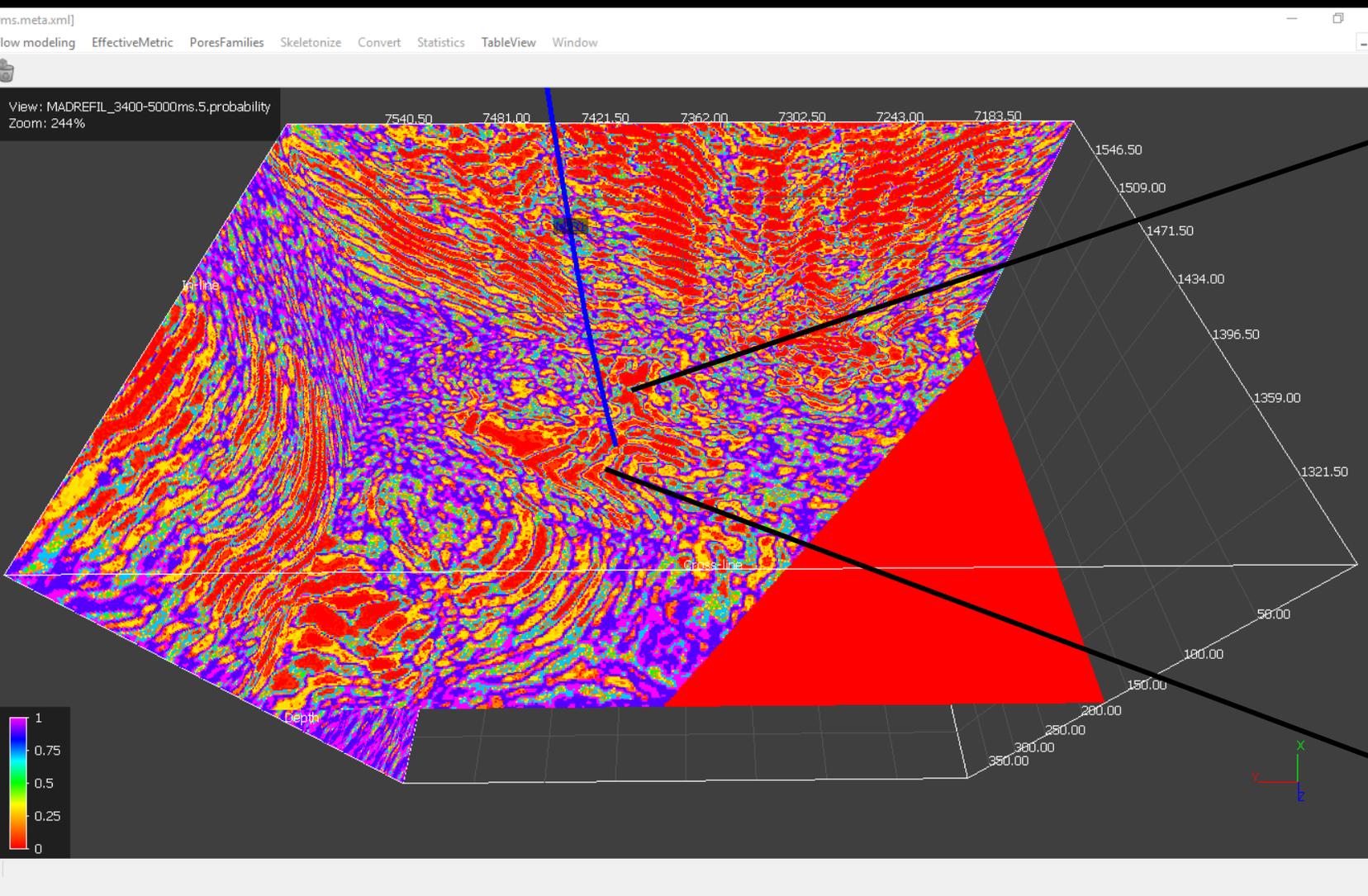
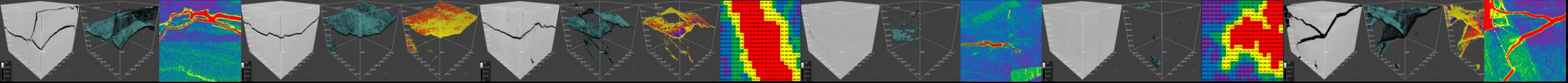
	A	B	C	D	E	F	G	H
1	0.72	0.64	0.51	0.70	0.82	0.64	0.58	0.69
2	0.54	0.64	0.64	0.74	0.65	0.62	0.65	0.63
3	0.69	0.82	0.78	0.90	0.78	0.78	0.66	0.57
4	0.76	0.81	0.85	0.87	0.89	0.91	0.90	0.78
5	0.96	0.73	0.86	0.88	1.11	1.22	1.00	0.86
6	0.92	1.03	1.13	1.09	0.99	0.80	0.89	0.88
7	1.20	0.89	0.93	0.93	1.00	1.05	0.99	0.97
8	1.44	1.15	1.27	1.03	0.89	1.20	0.97	0.89
9	1.31	0.98	1.11	0.93	0.98	1.05	0.93	0.85
10	0.92	1.02	1.07	0.94	1.02	0.81	0.91	0.88
11	0.86	0.84	1.07	0.94	0.87	0.97	0.93	0.80

Hoja1 Hoja4 Hoja5 H ...

Listo

WELL	Colore	Status
X		DRY

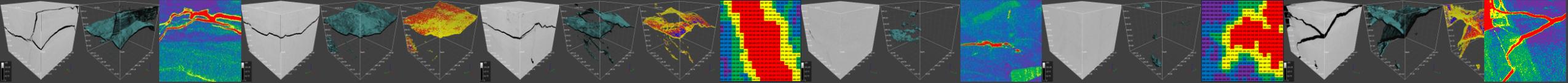
**Multifractal Mapping**



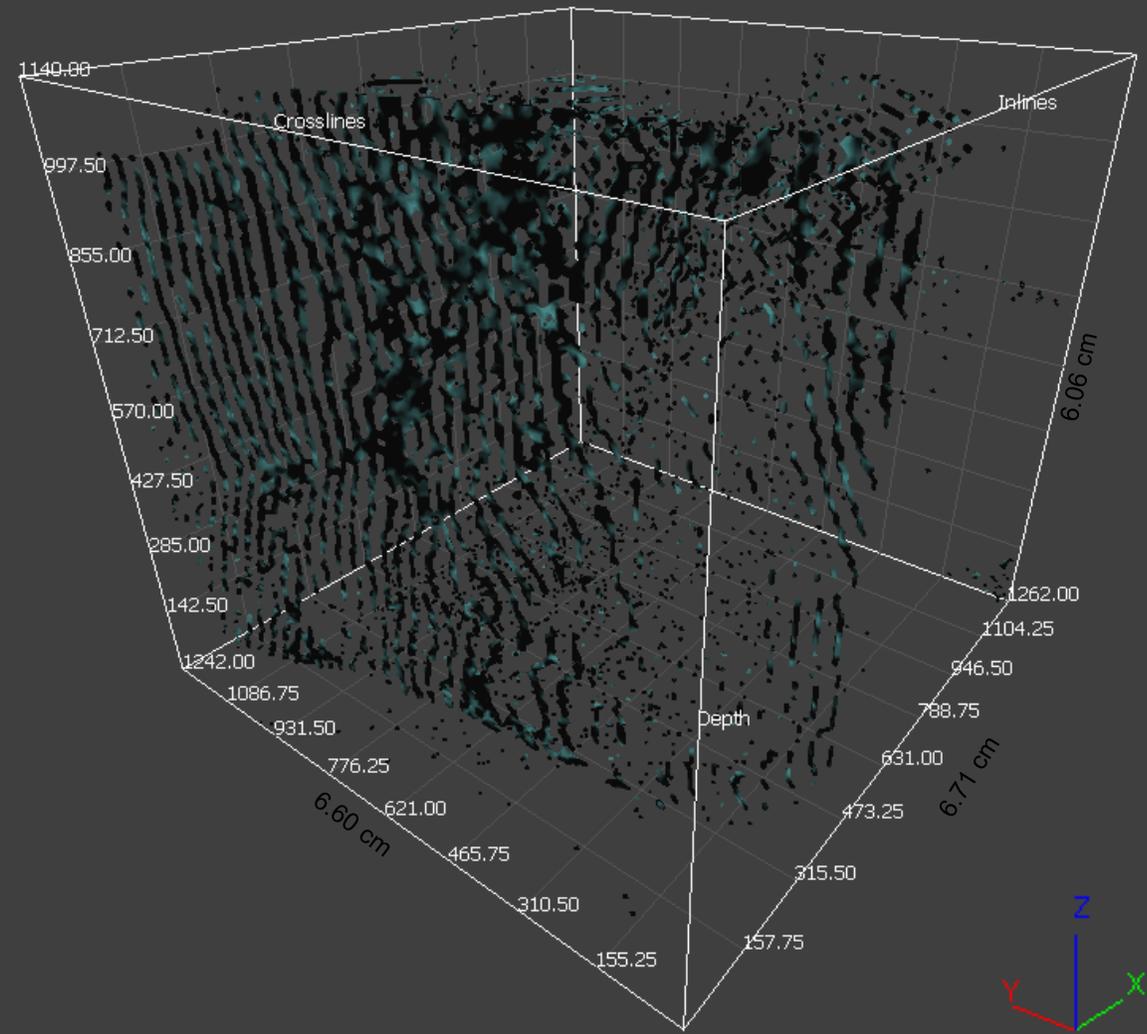
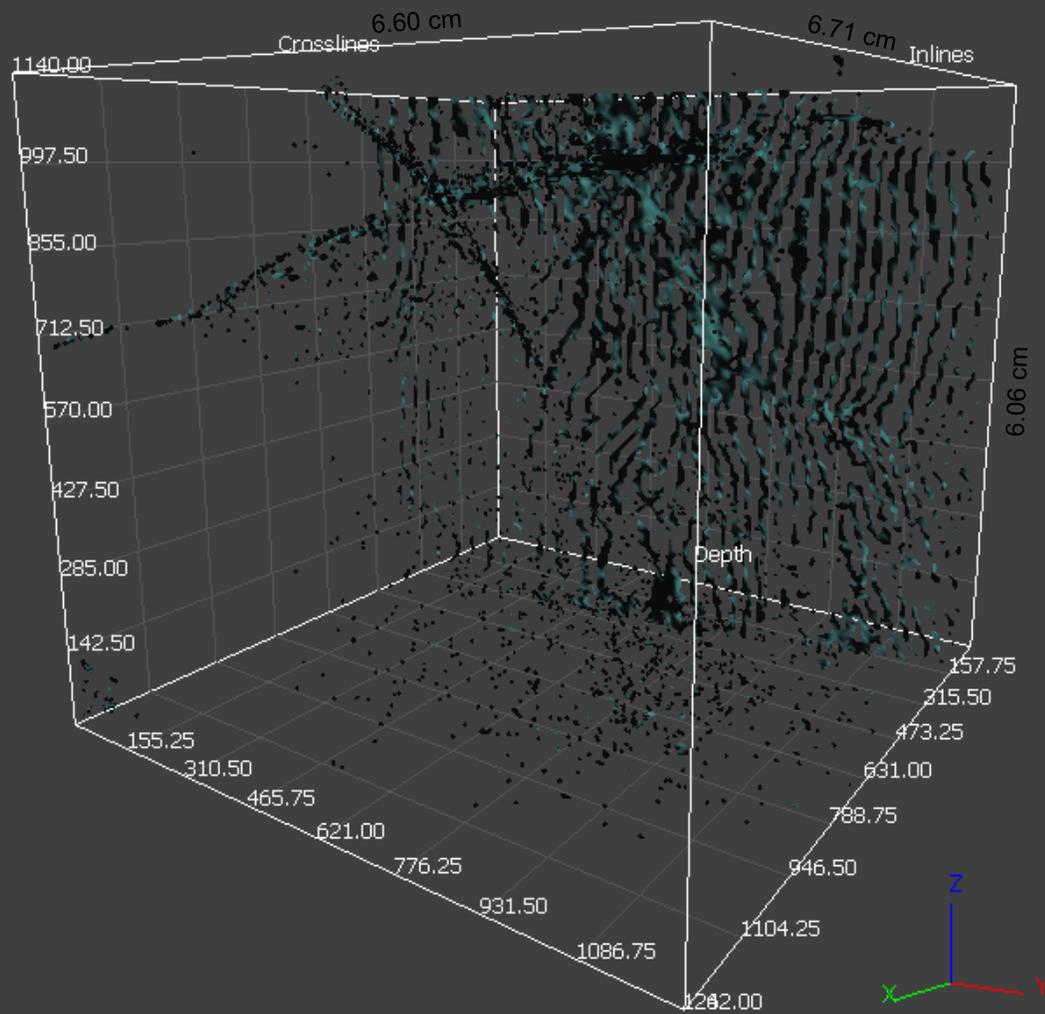
**Micro Cube  
 X-KM**

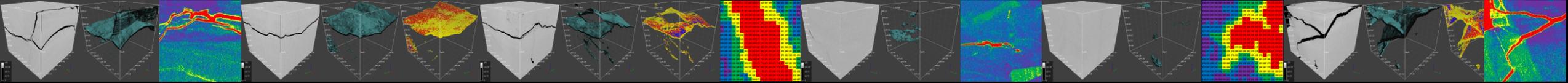
**Probability Cube**

WELL	Colore	Status
X		DRY



# Коридор Трещин

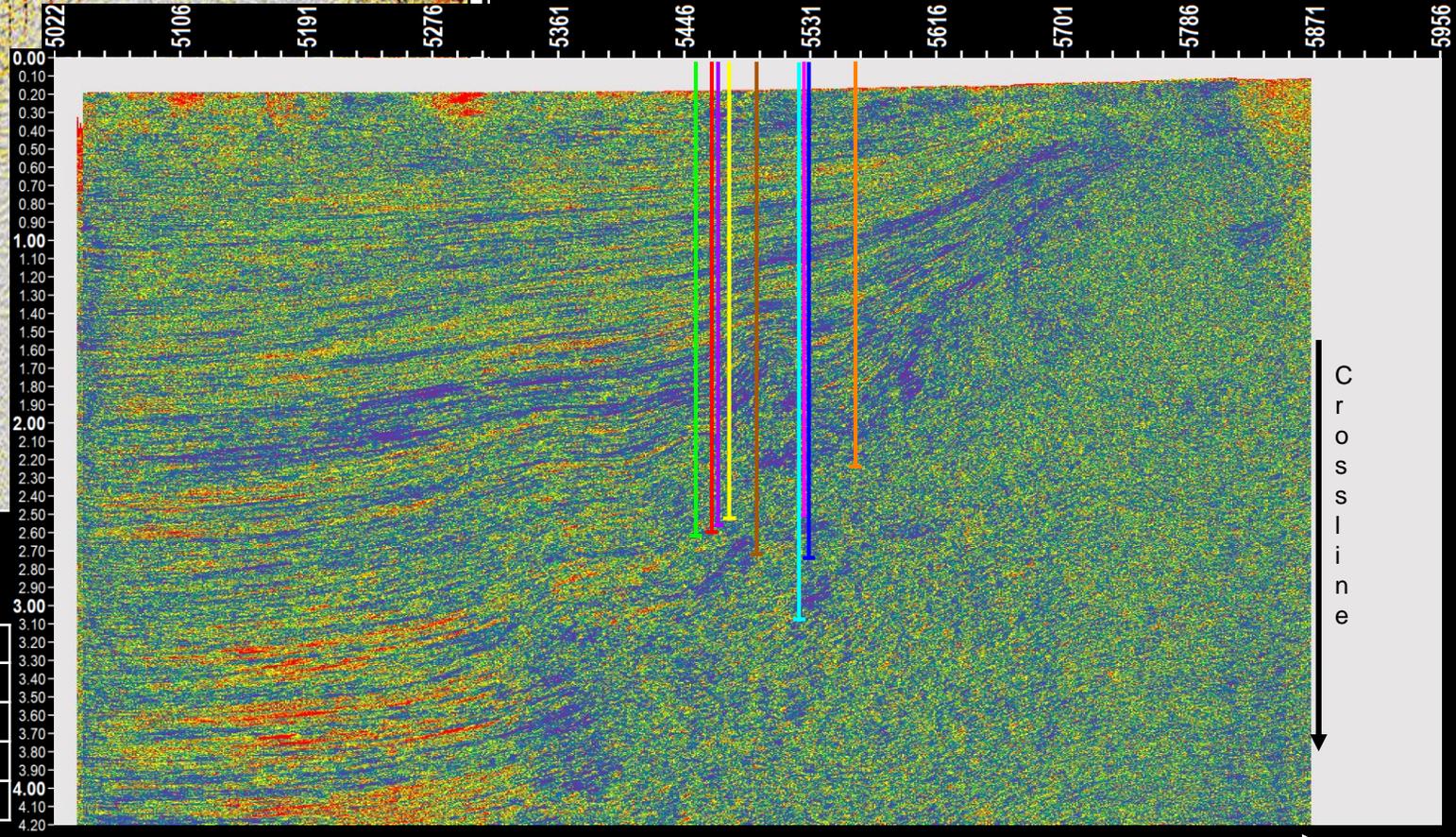
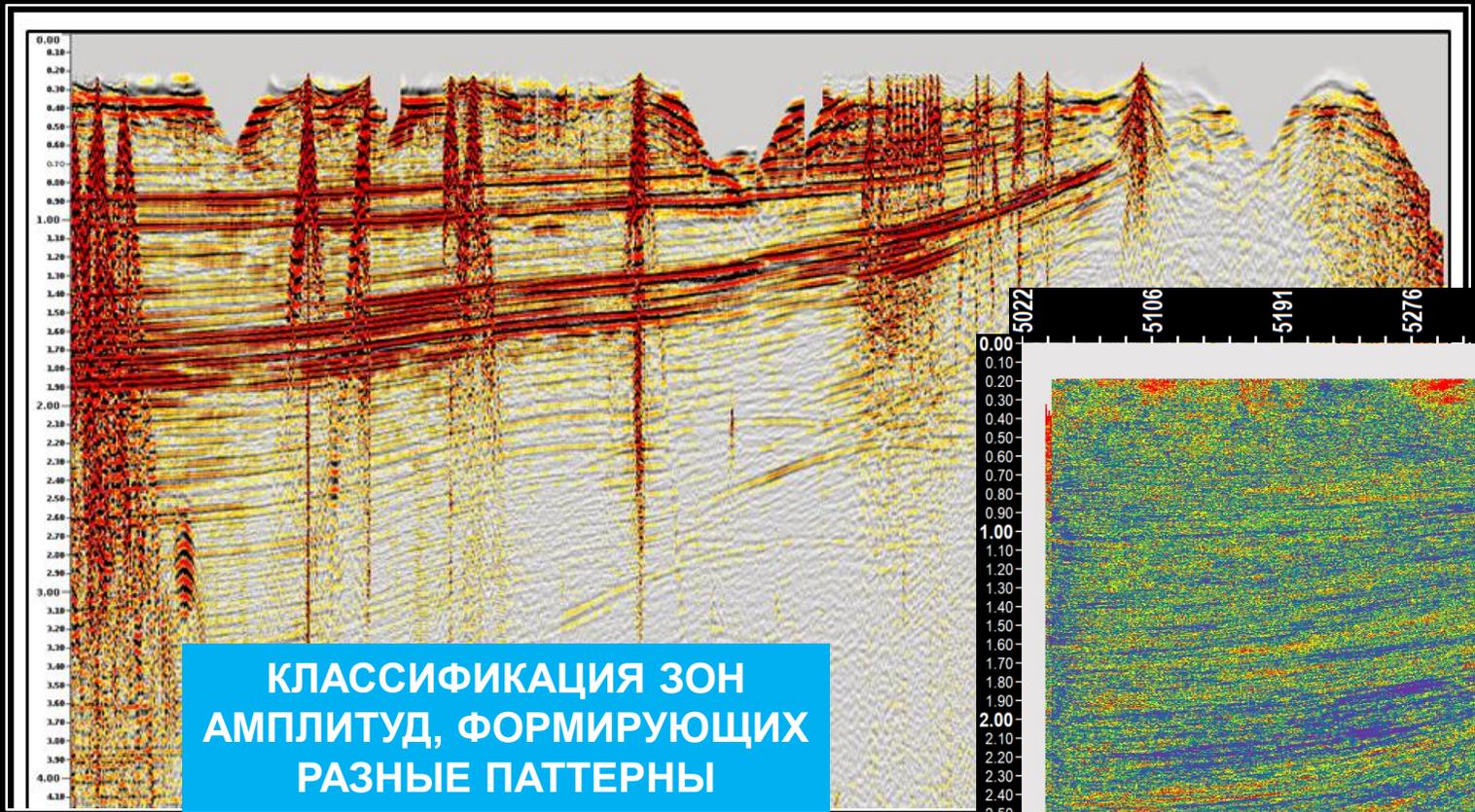




# Inline 1100 Multifractal of Original Seismic / Мультифрактальная карта: 4.2s

## Multifractal Exis X

Clasificación



WELL	COLORE	Status
10	Blue	Producer
11	Cyan	Observation
12	Green	Closed
13	Yellow	Producer
14	Red	Closed

WELL	Colore	Status
15	Purple	Cerrado
16	Magenta	Cerrado
17	Brown	En espera
18	Orange	Observación

Z-slice