CCMC-LiU-AMNH Partnership: Advanced Visualization

Alexander Bock

Scientific Visualization Group

Linköping University

Sweden

Who am I

- 4th year PhD student in Scientific Visualization
- Collaborating with CCMC since 2012

What is Scientific Visualization?

- "The purpose […] is to graphically illustrate scientific data to enable scientists to understand, illustrate, and glean insight from their data." (*wikipedia.org*)

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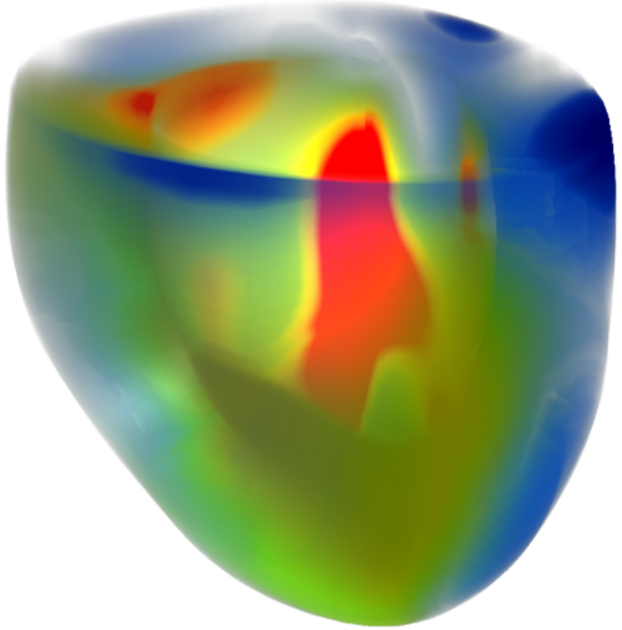

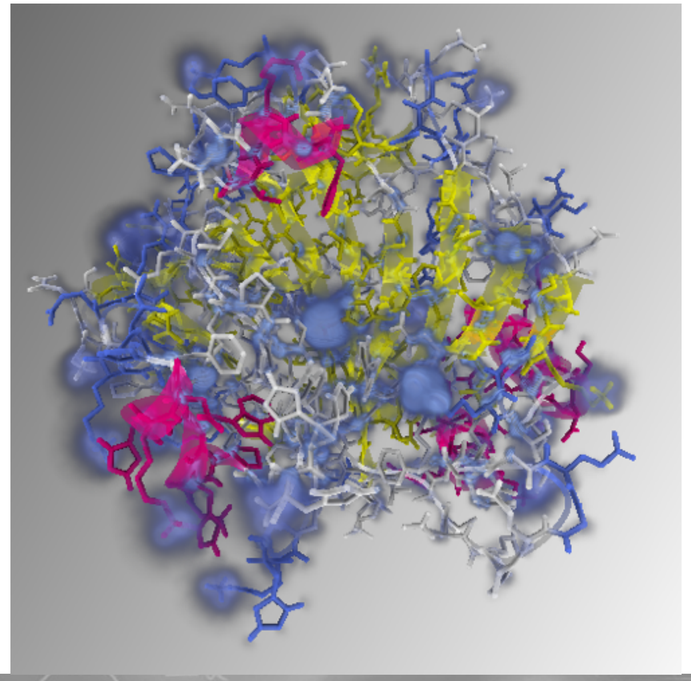

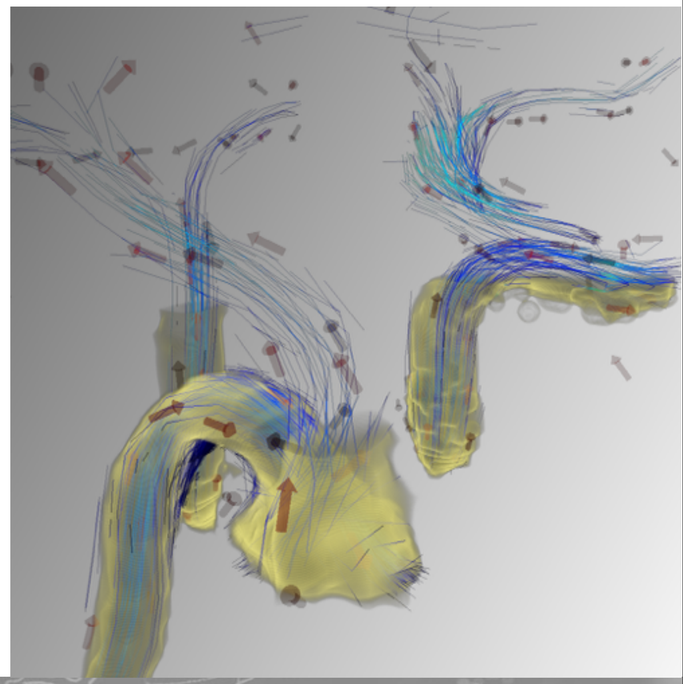

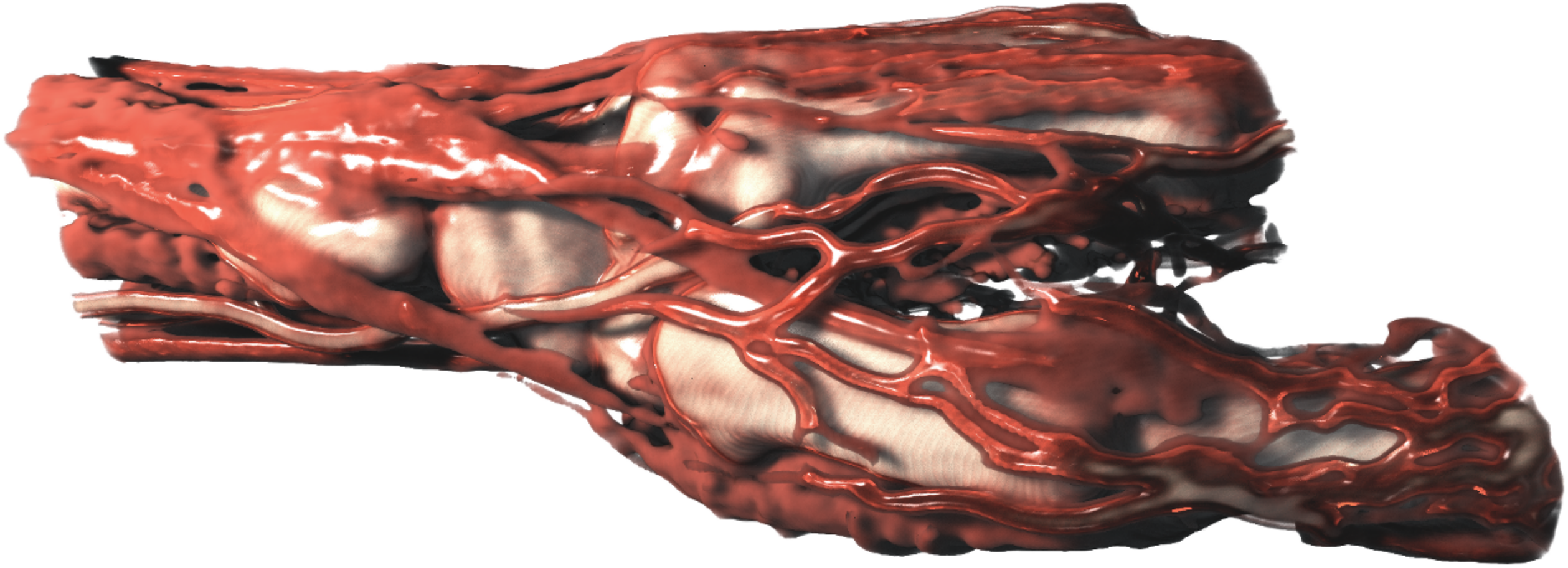

Basics of Volume Rendering

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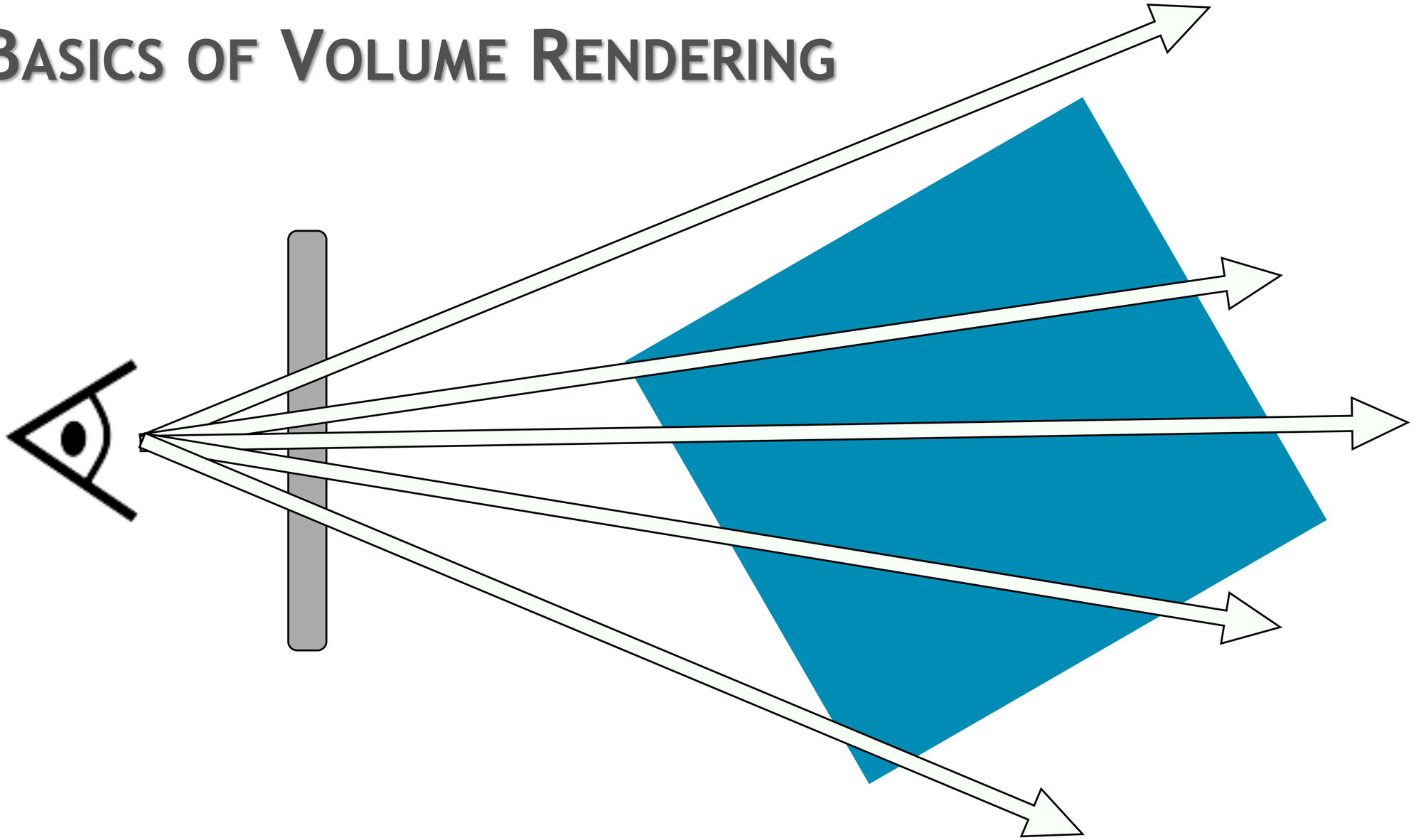

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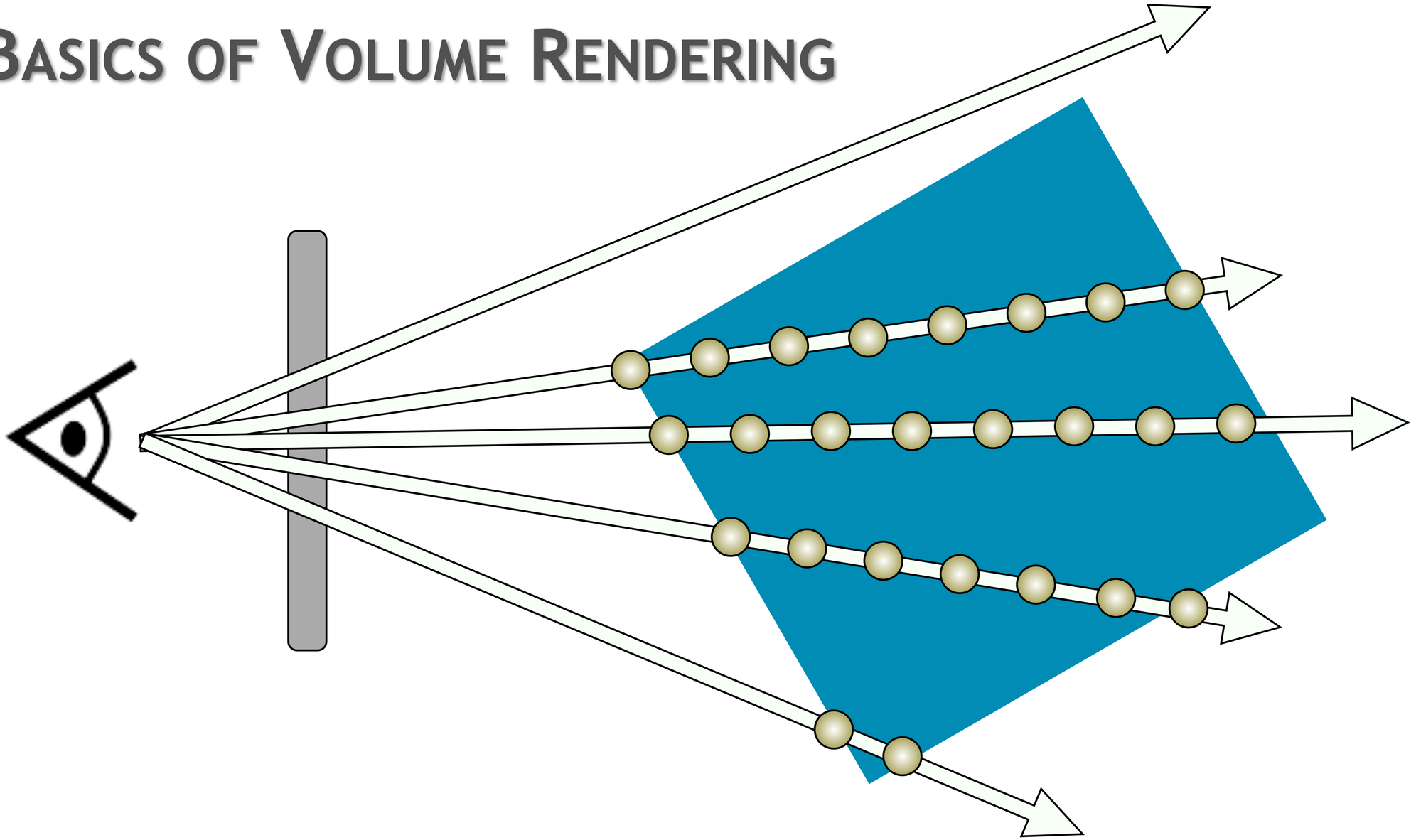

What Has Been...

MARTIN TÖRNROS

Interactive Visualization of Space Weather Data

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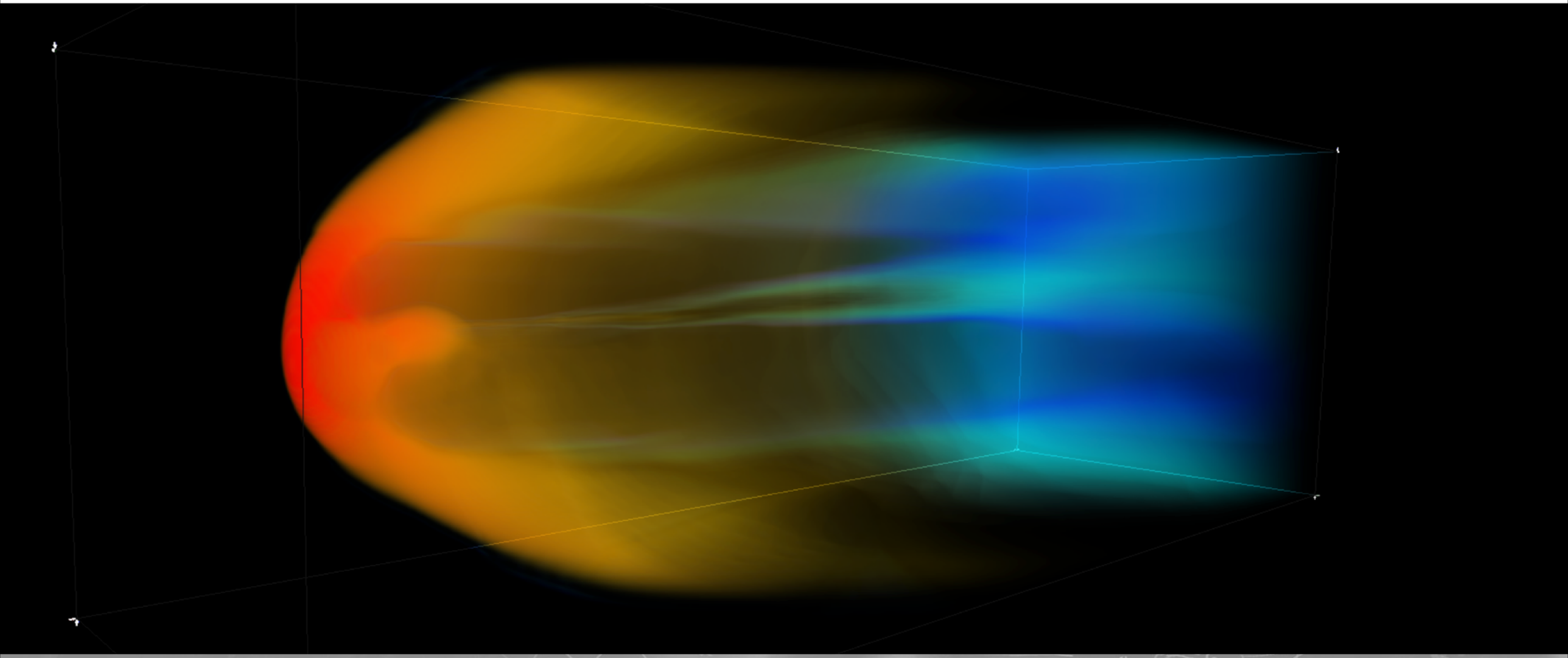

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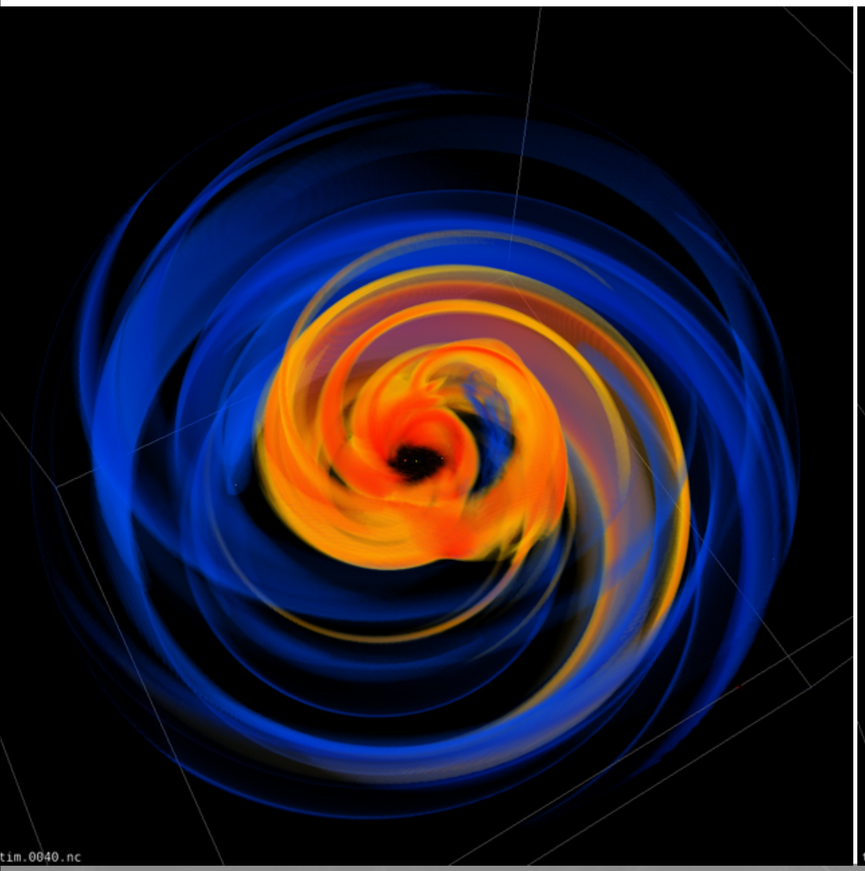

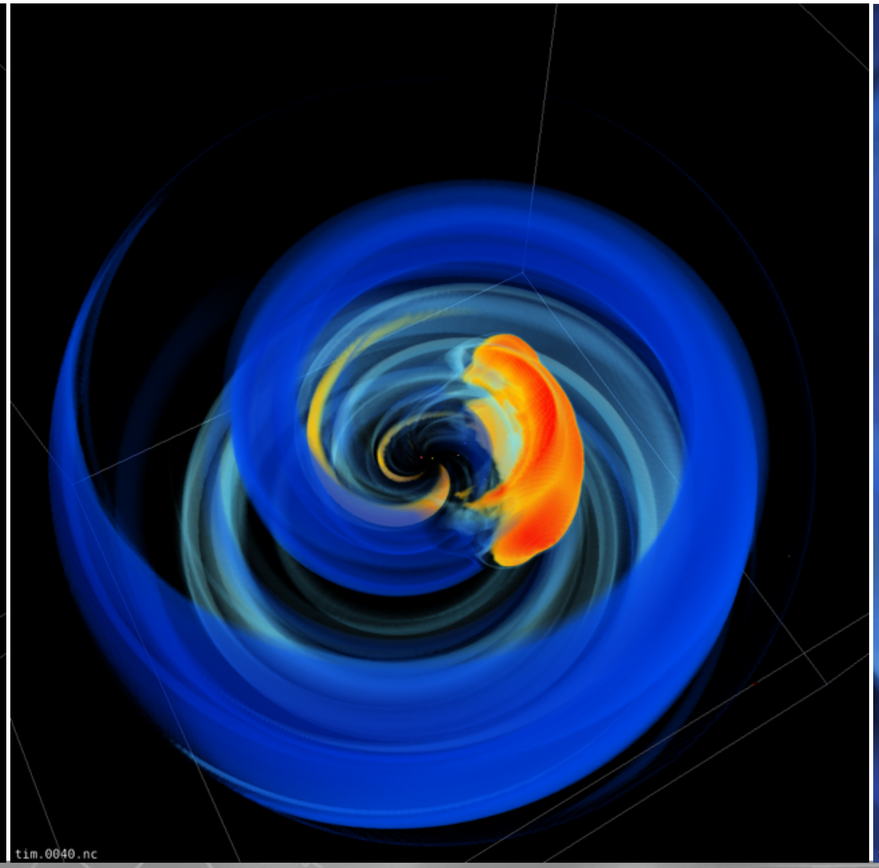

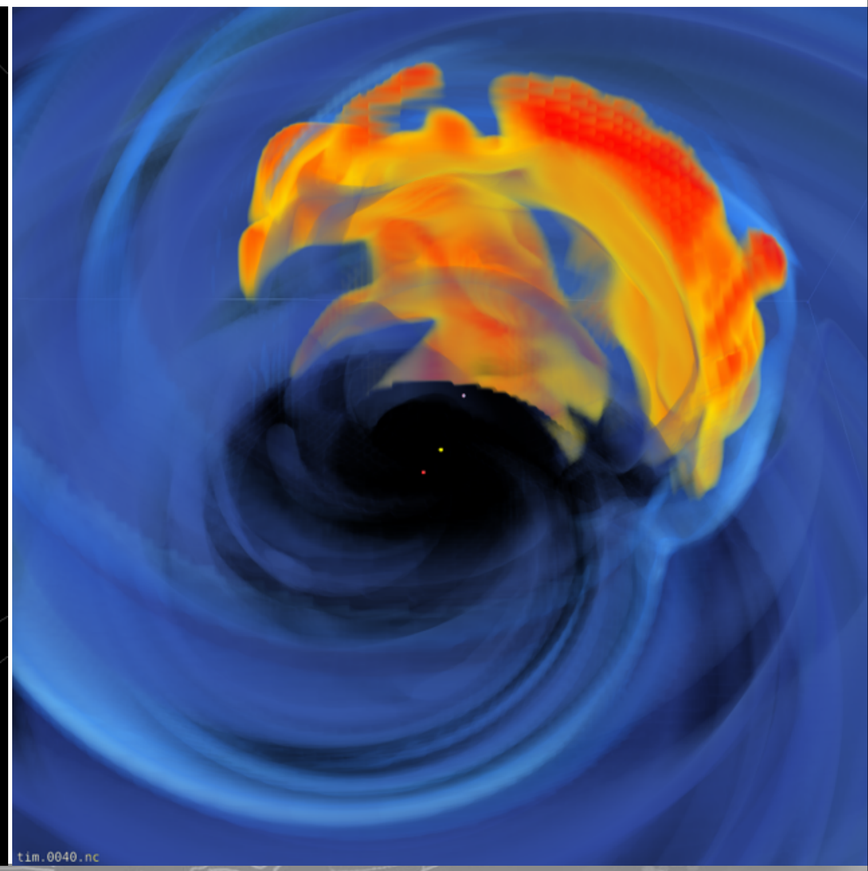

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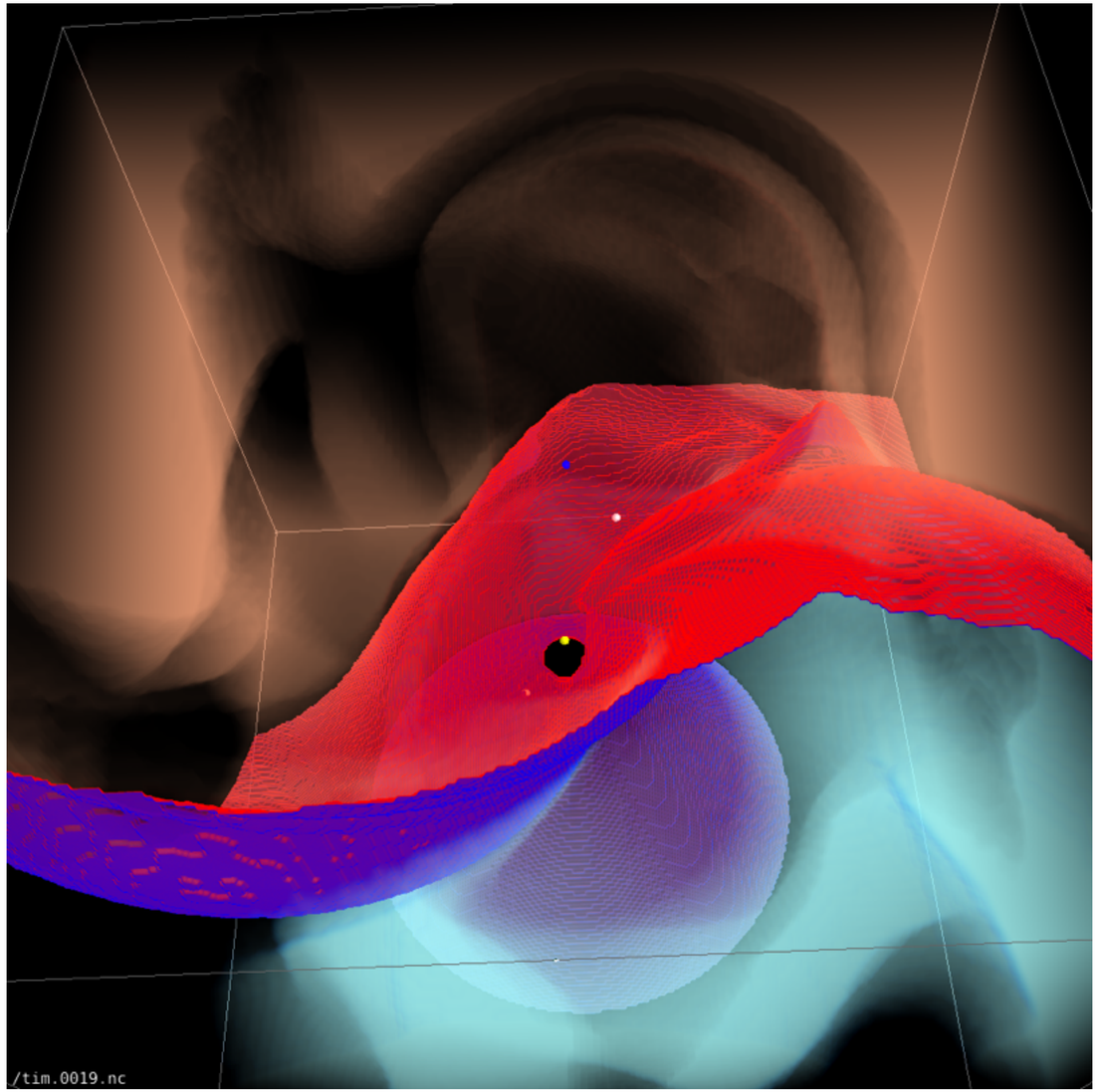

VICTOR SAND

Dynamic Visualization of Space Weather Data

INTERACTIVITY

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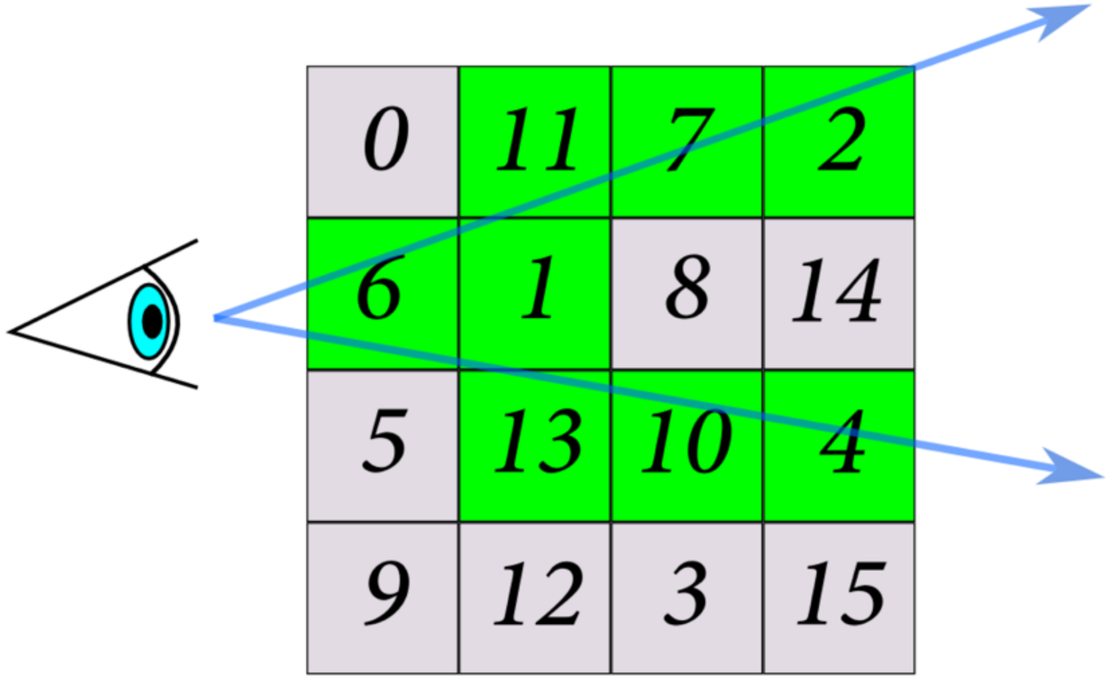
⇒ Upload parts of the image that have changed, cache the rest

Dynamic Visualization of Space Weather Data



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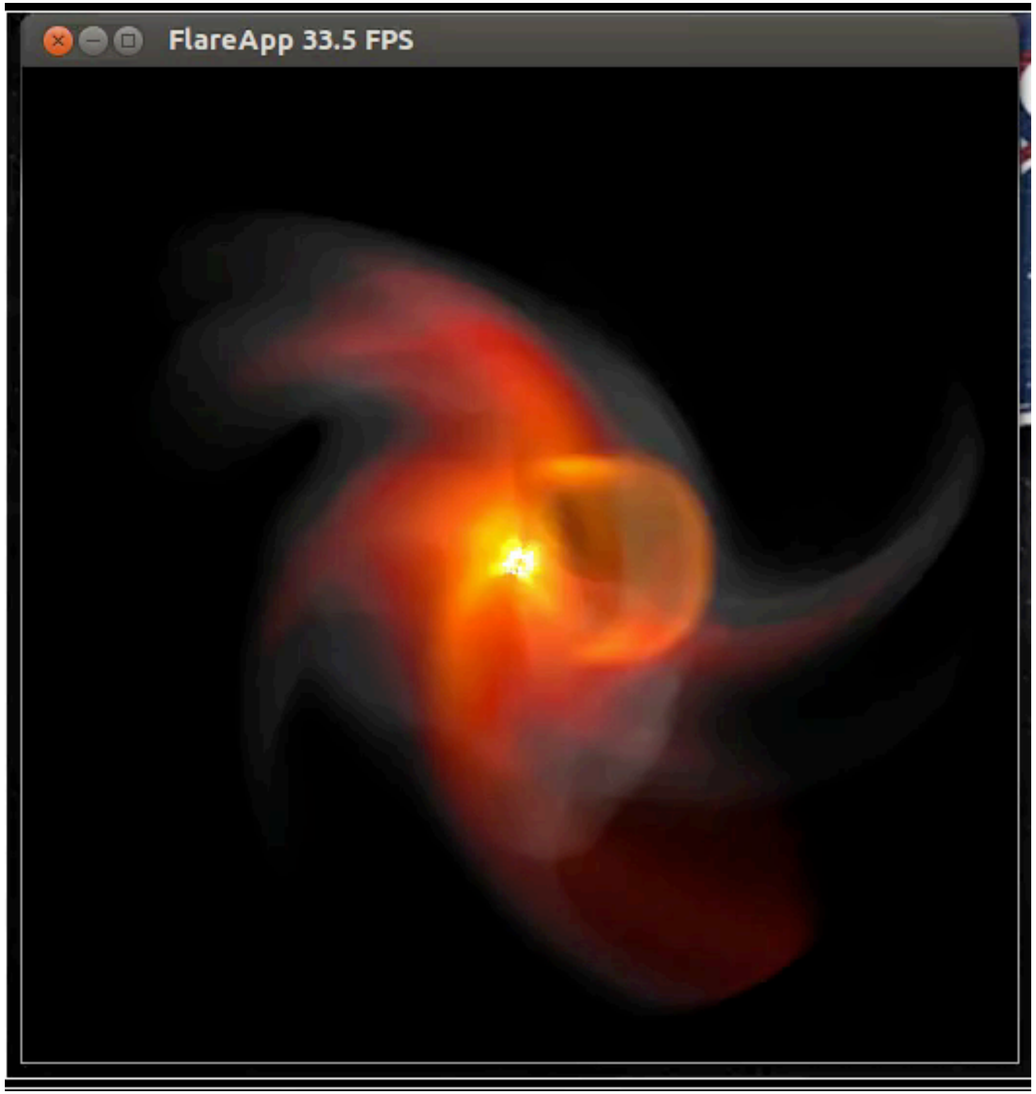

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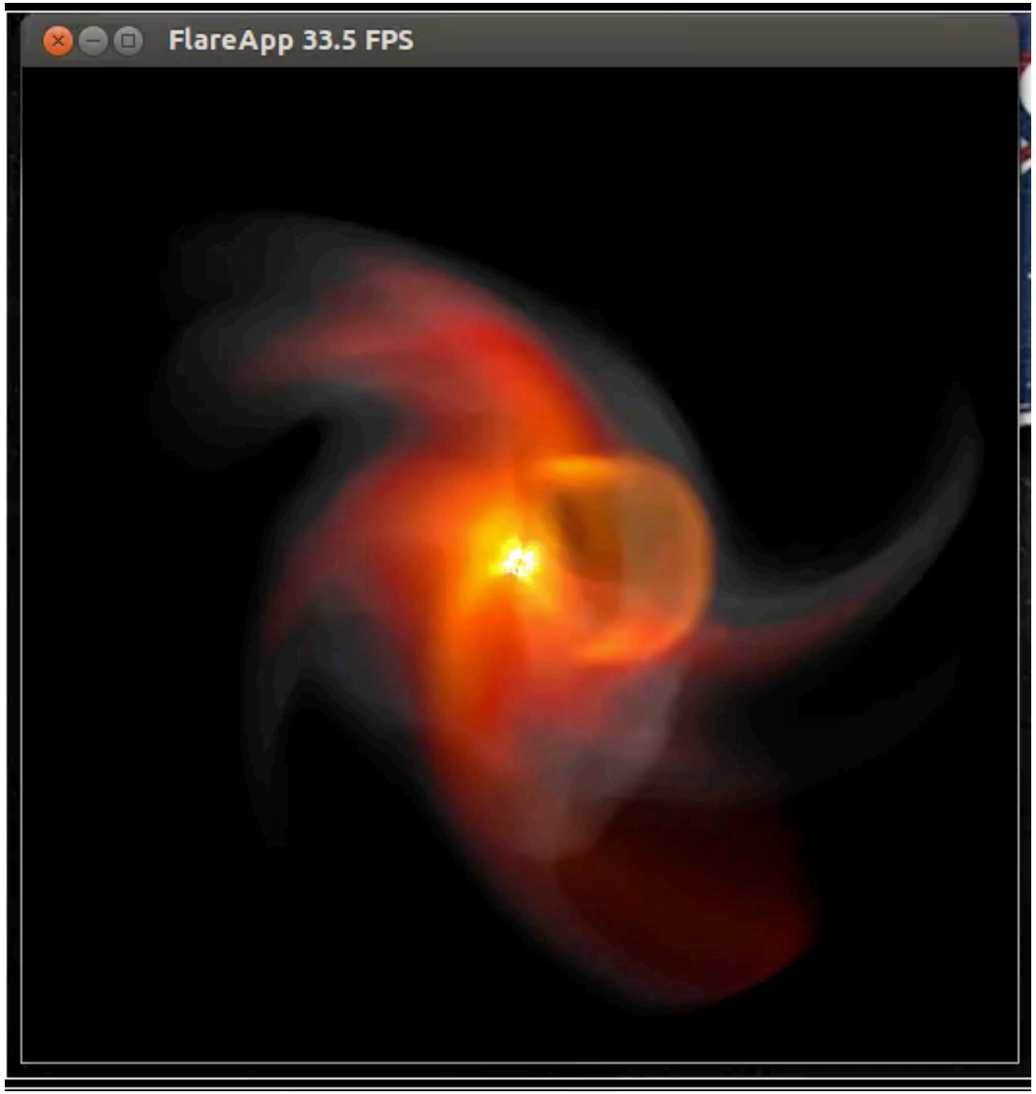



PUT ONLY THE
2 WIRELESS
MICROPHONES
IN THIS CABINET

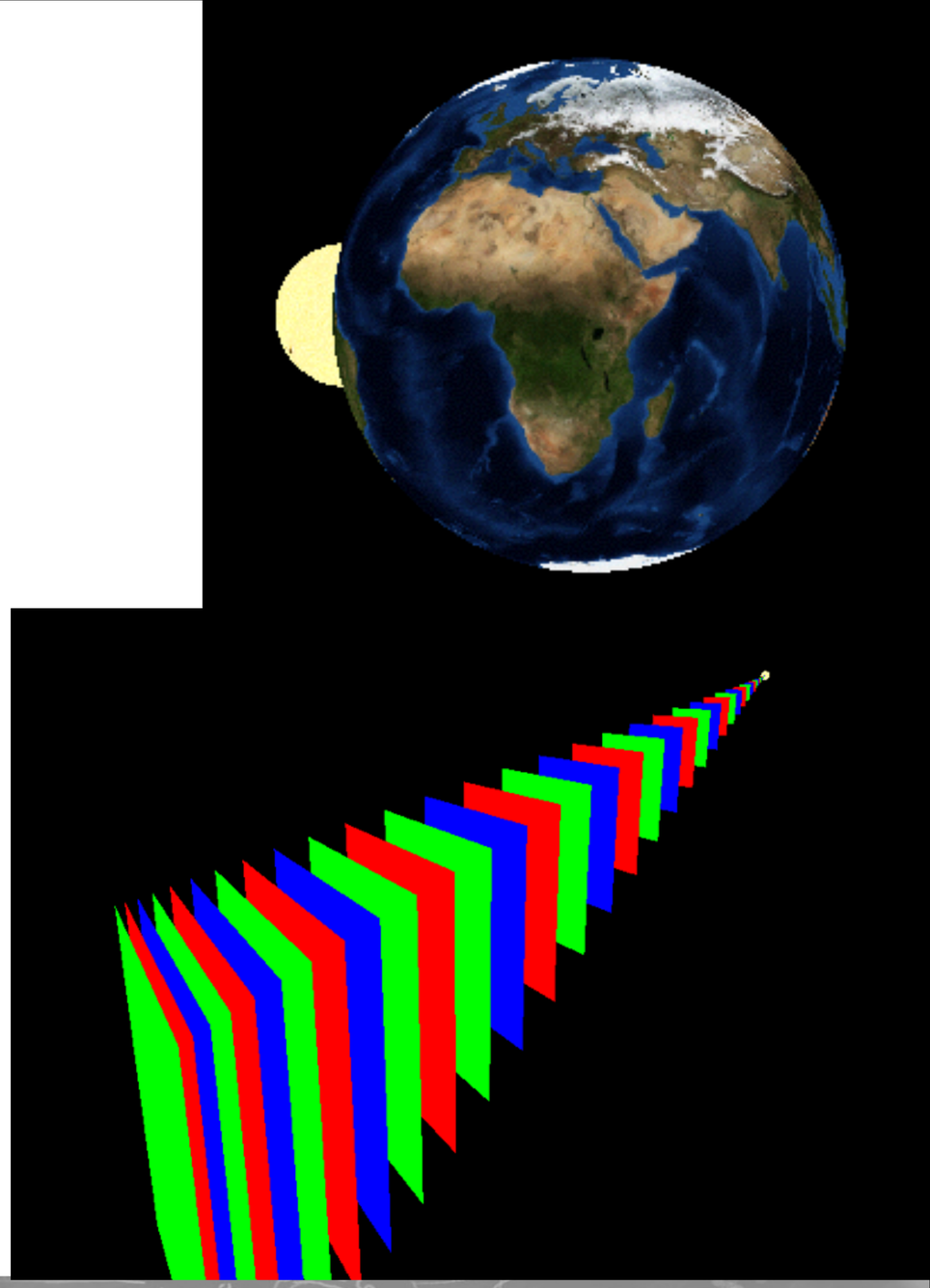
Civilingenjör Medieteknik

from **Linköping University** PLUS 2 weeks ago NOT YET RATED

WHAT IS...

OpenSpace

- Open Source (BSD-license) software to contextualize the Universe
- Multiscale rendering ($\approx 10^{-30}$ to $\approx 10^{30}$ m) in a single coordinate system
- Chi-Wing Fu and Andrew J. Hanson, *A Transparently Scalable Visualization Architecture for Exploring the Universe*, TVCG 2007
- Replace (x,y,z) = (x',y',z',e) where {x,y,z}' * 10^{e} = {x,y,z} to reduce the problem of IEEE 754 float precision
- Order-independent transparency
- Extensibility for new rendering algorithms and modalities



Hans-Christian Helltegen

Multimodel-aware spatio-temporal interpolation

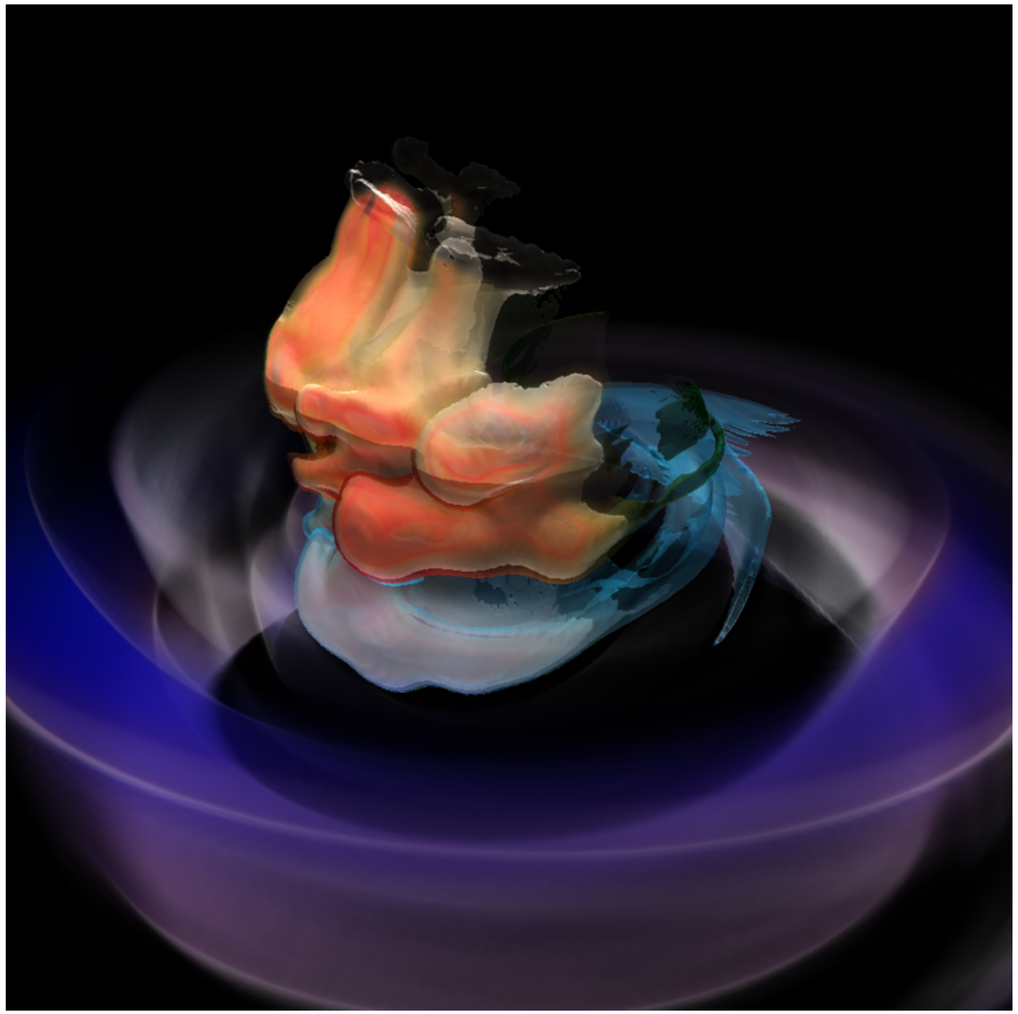
Jonas Strandstedt

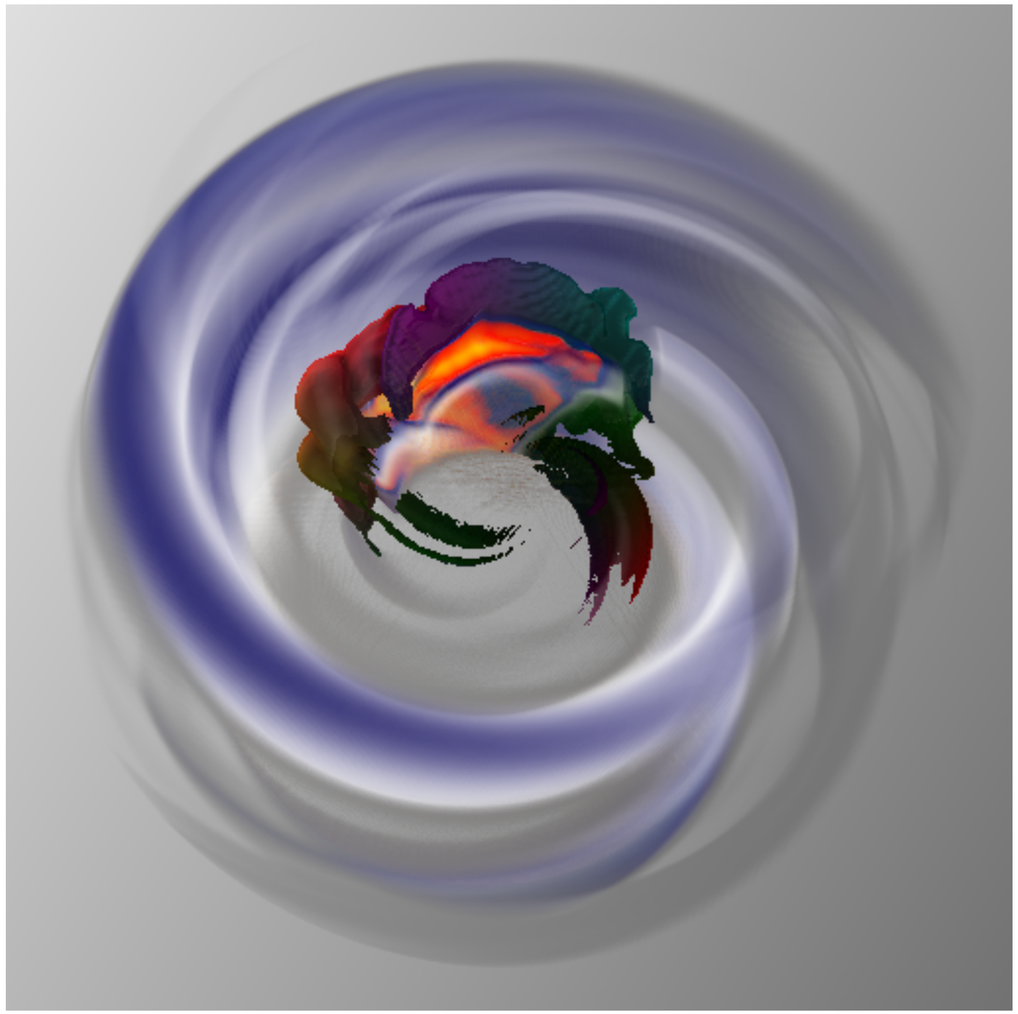
Efficient multi-variate classification

of Coronal Mass Ejection events in ENLIL simulations

Volume Fusion

Volume Fusion





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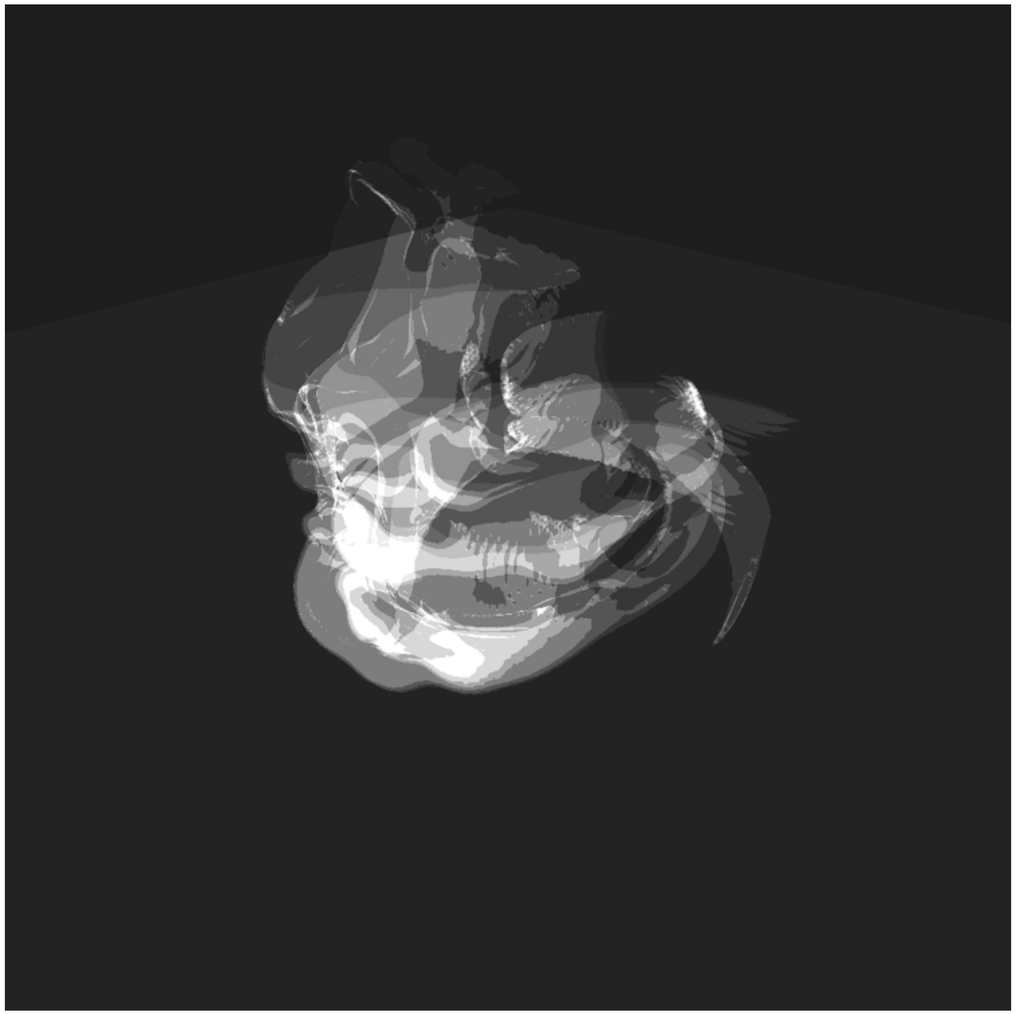
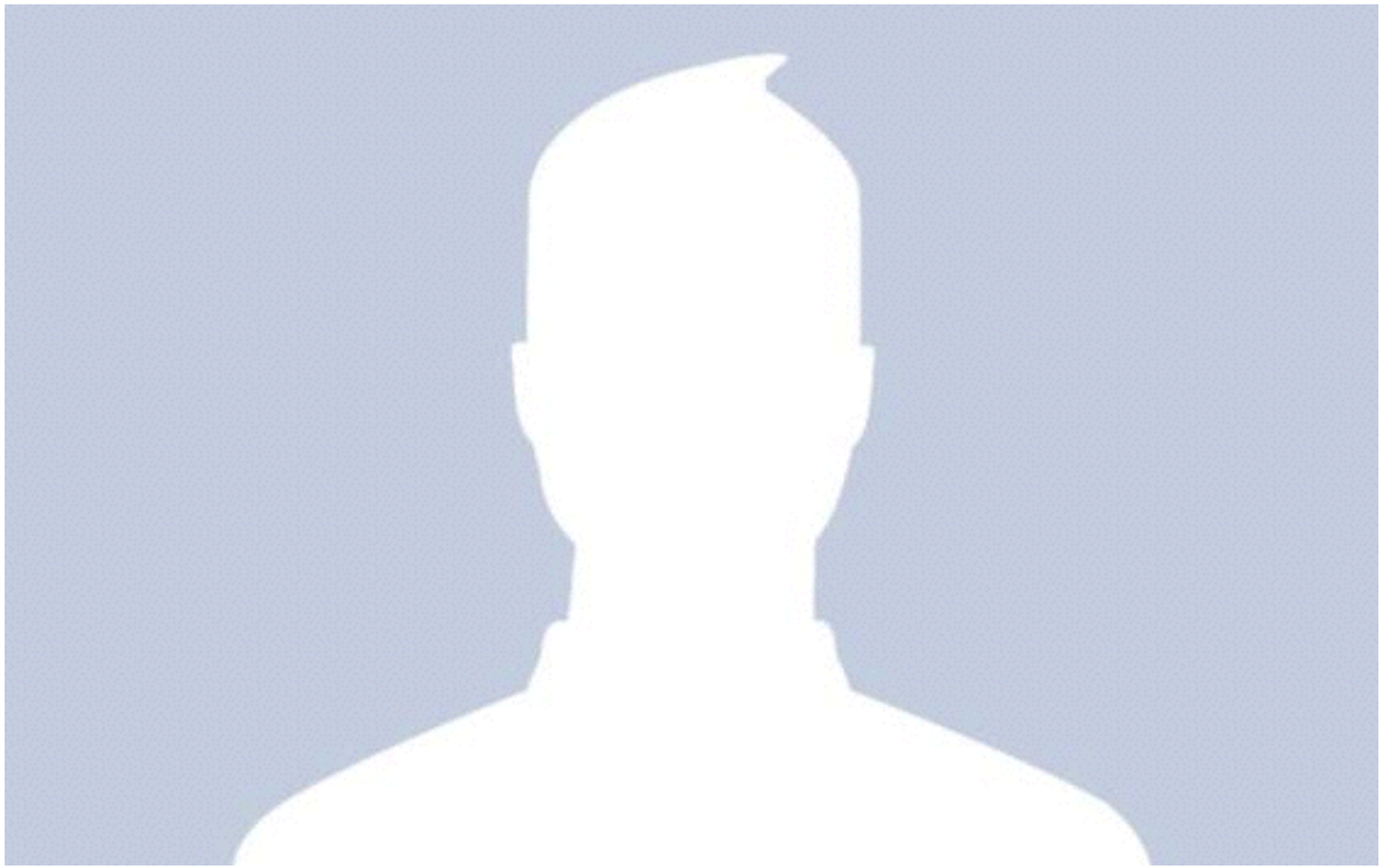
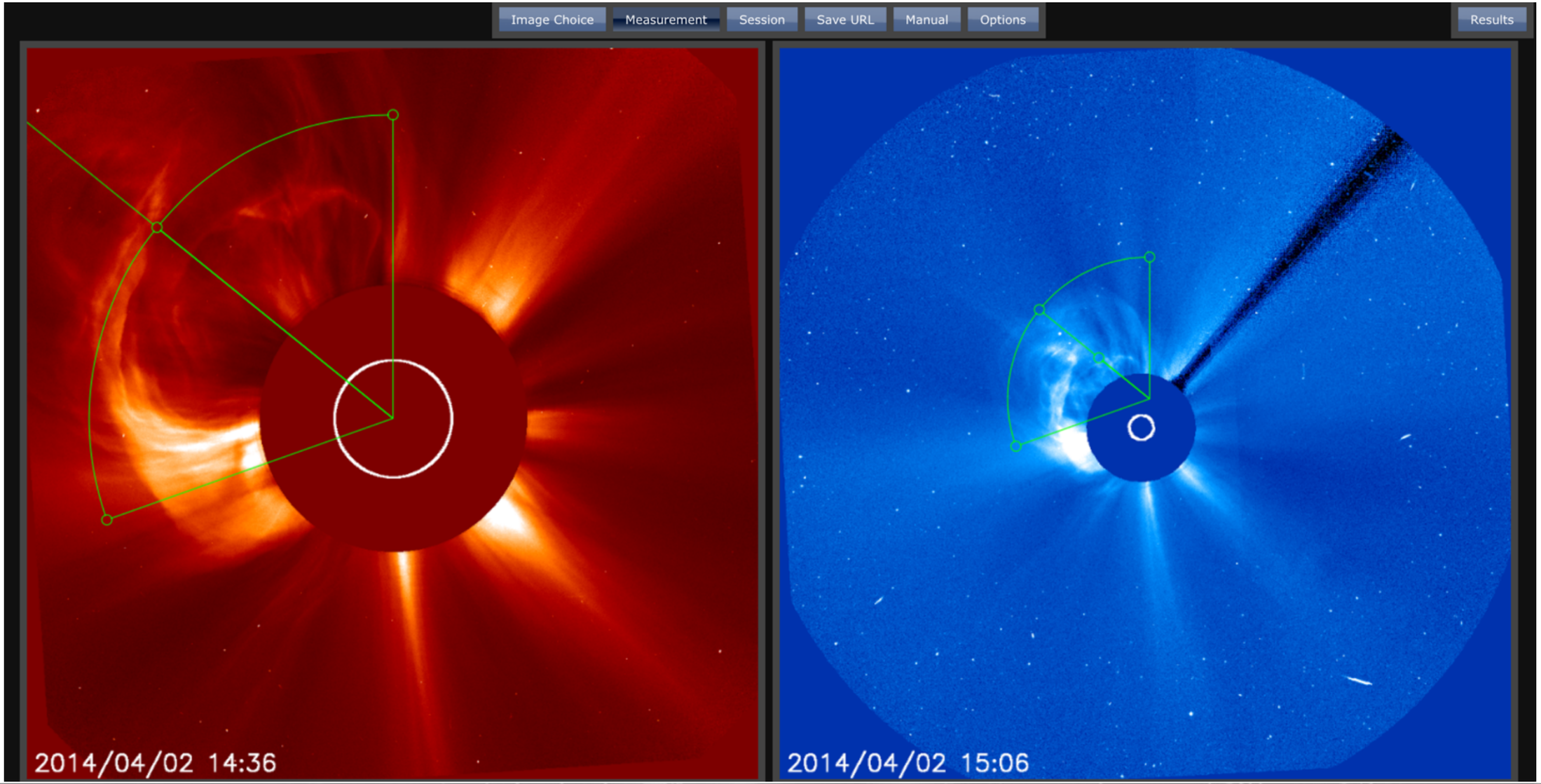


What Will Be...

Master Theses?



Visual Verification of Simulation Results



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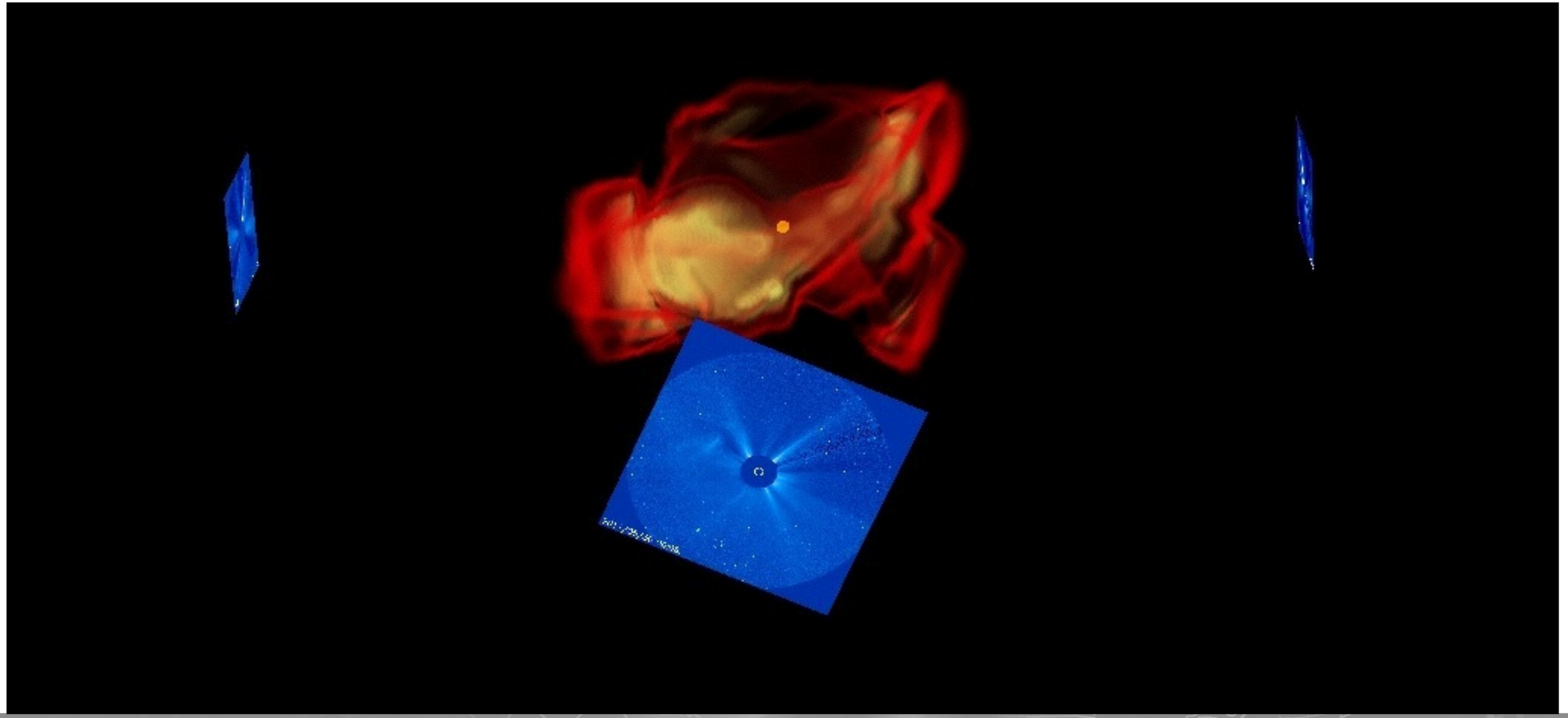

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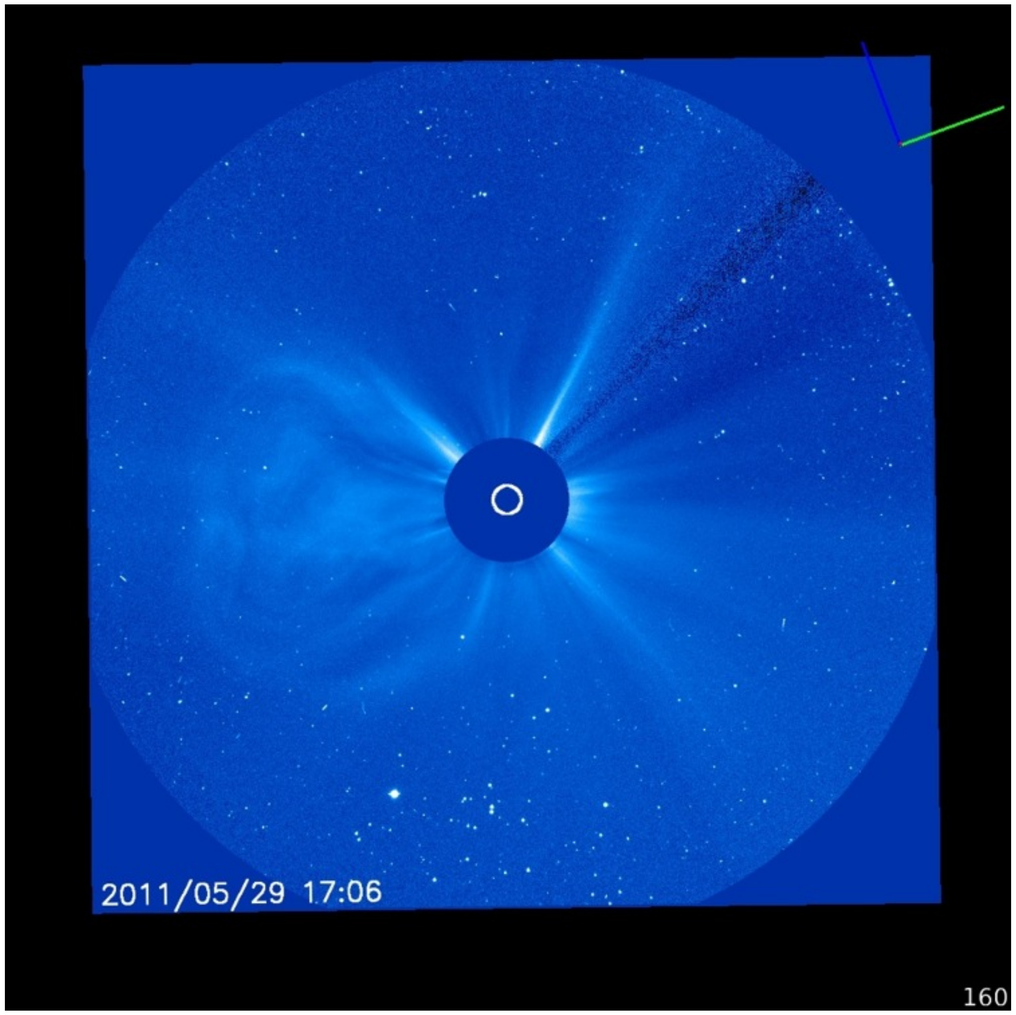

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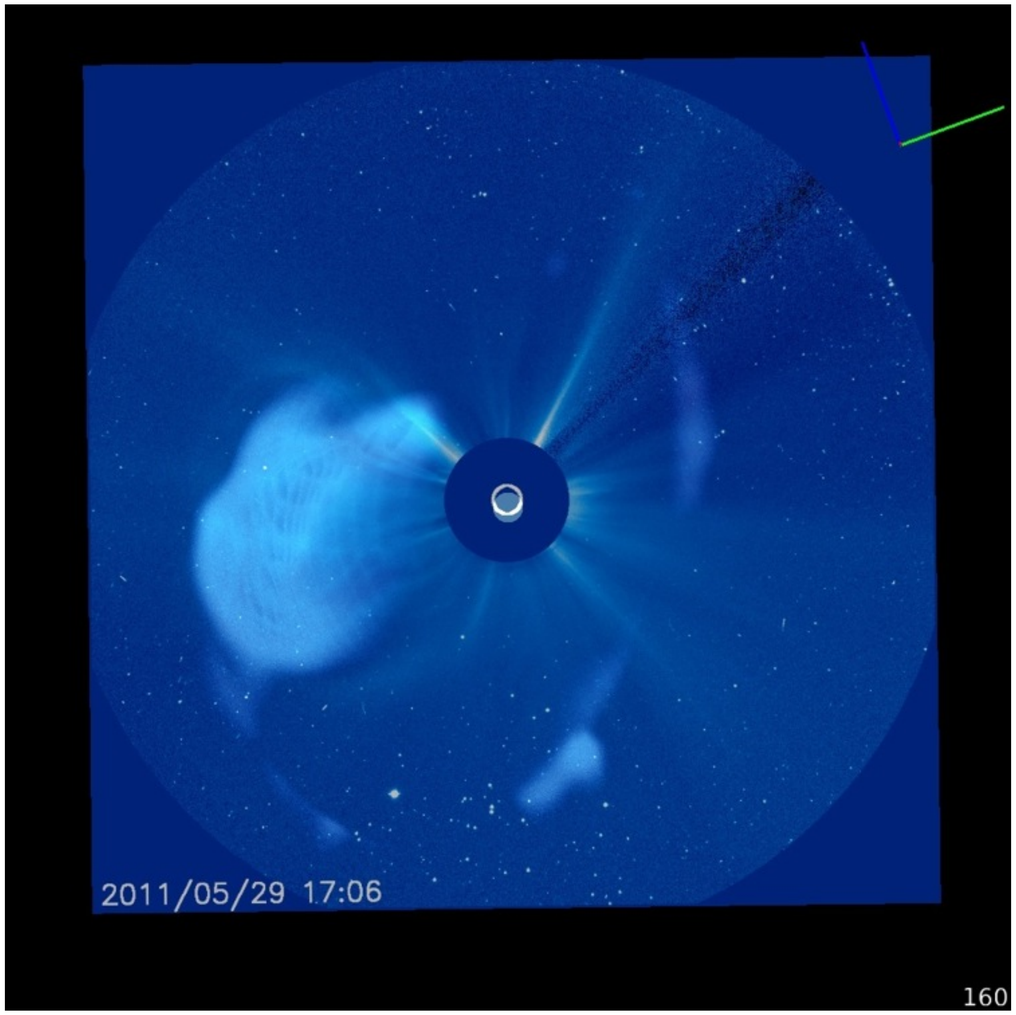

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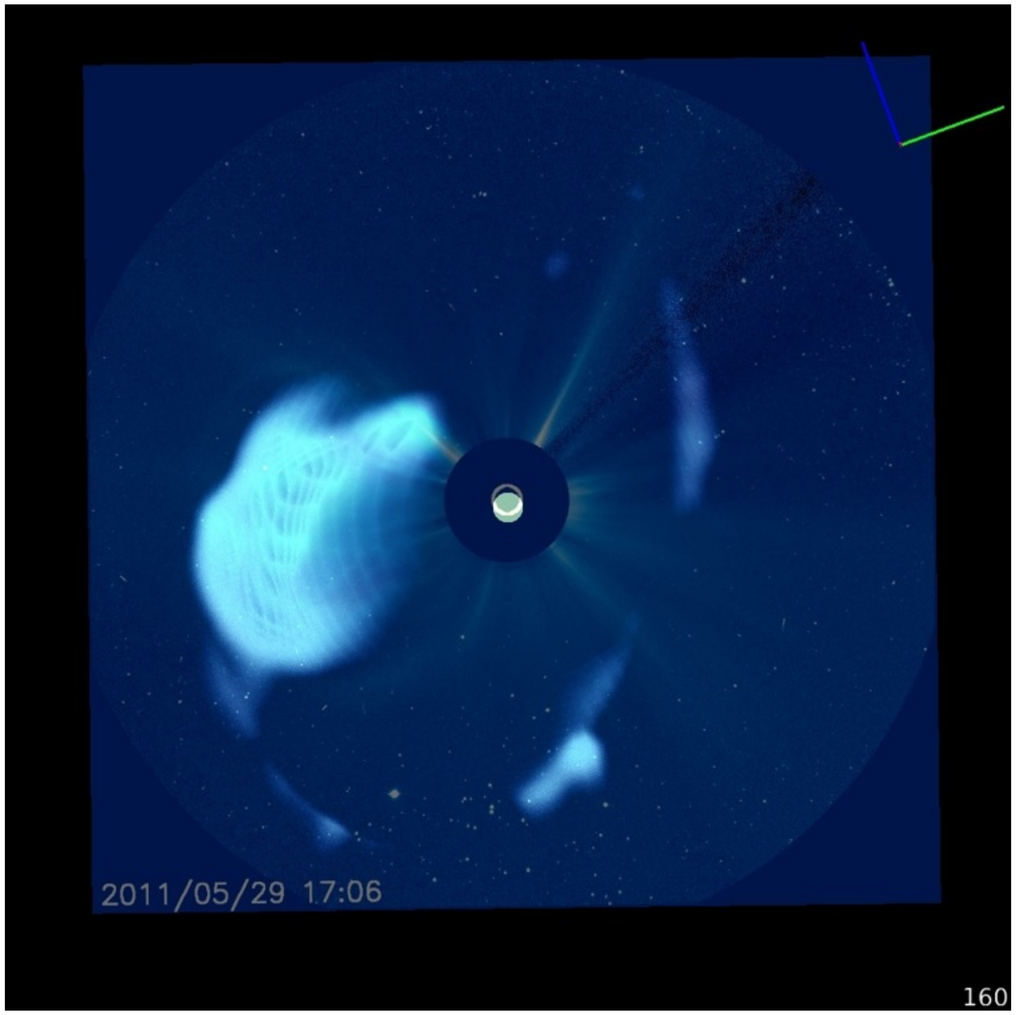

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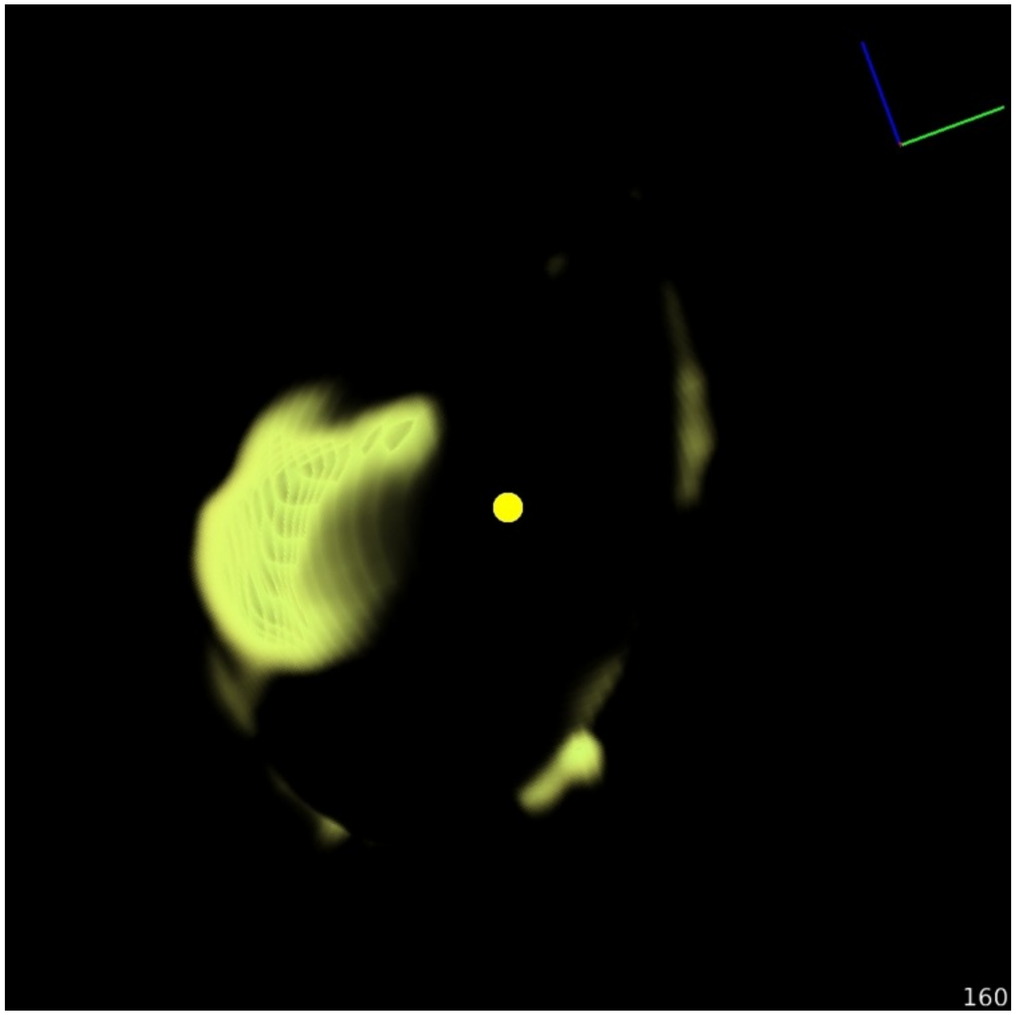

Rainbow Color Maps

Rainbow Color Maps

- Coline Ware, “Color sequences for univariate maps: Theory, experiments and principles”, IEEE Computer Graphics and Applications, 1988.
- B. E. Rogowitz, L. A. Treinish, and S. Bryson, “How not to lie with visualization,” Computers in Physics, vol. 10, no. 3, pp. 268–273, 1996.
- D. Borland and R. M. Taylor, “Rainbow Color Map (Still) Considered Harmful,” IEEE Computer Graphics and Applications, vol. 27, no. 2, pp. 14-17, Apr. 2007.
- http://mycarta.wordpress.com/2012/05/12/the-rainbow-is-dead-long-live-the-rainbow

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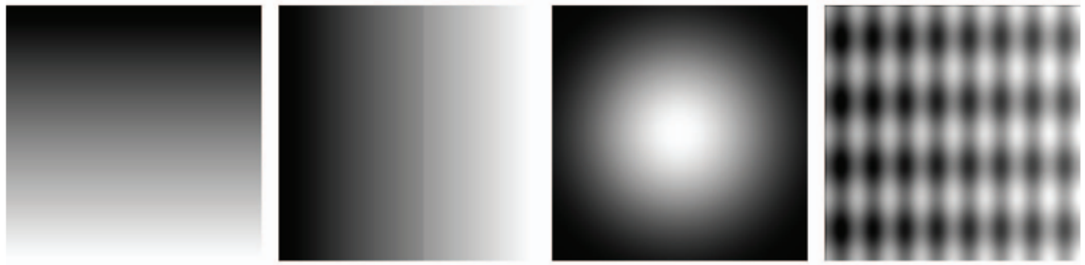

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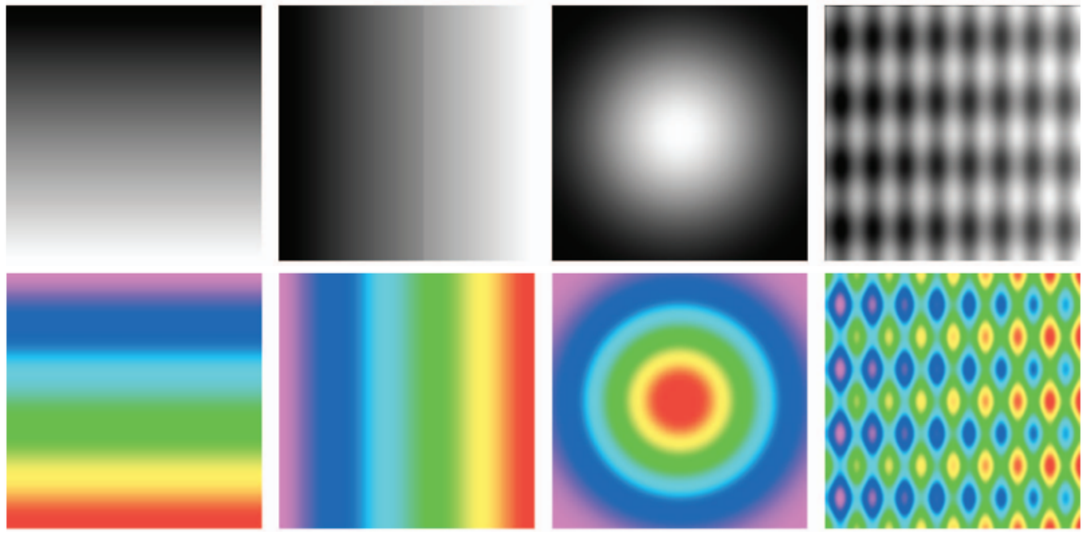

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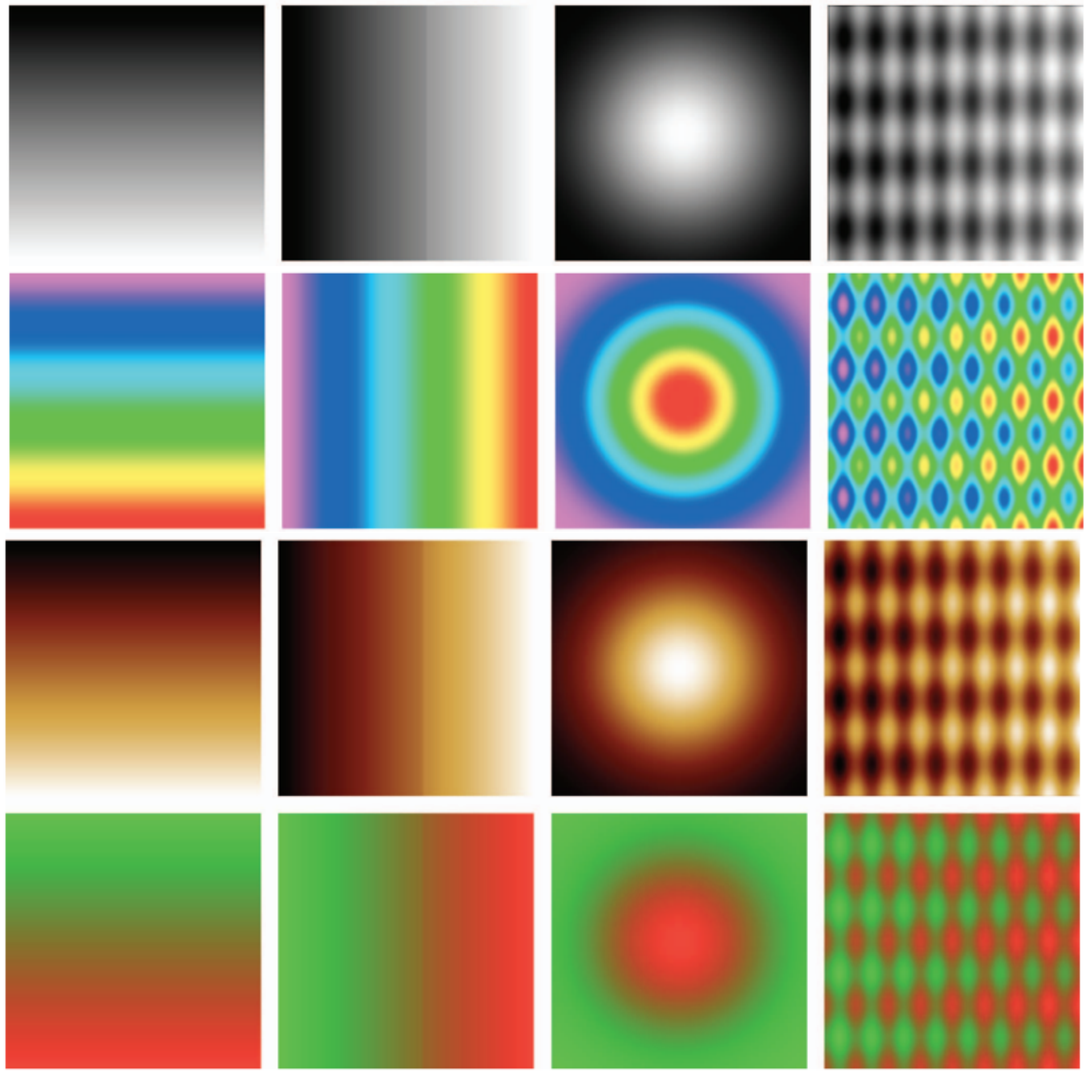

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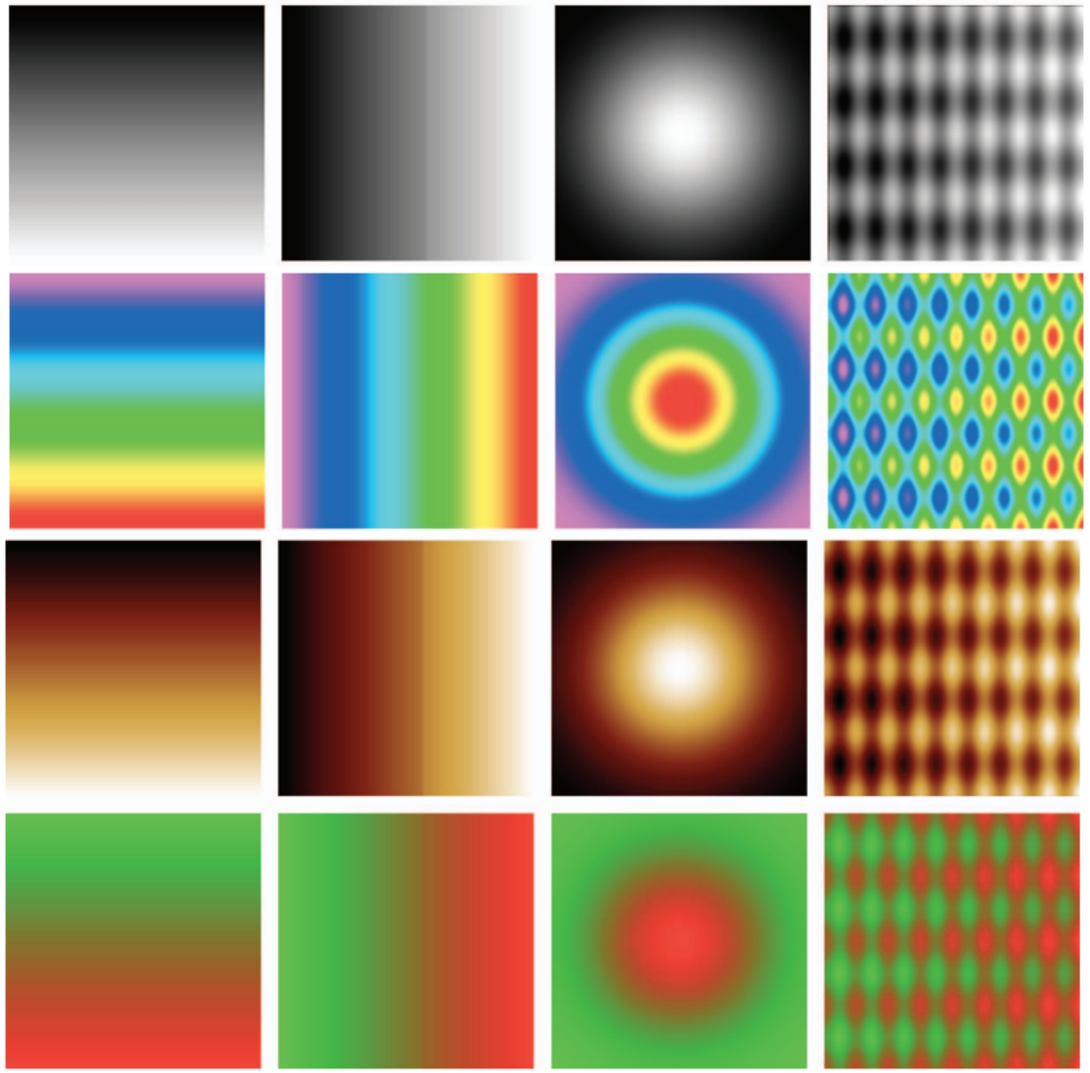

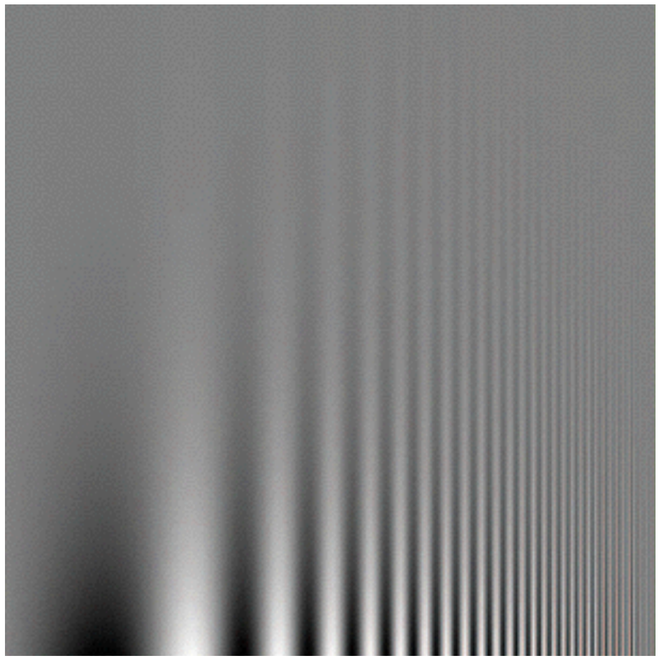

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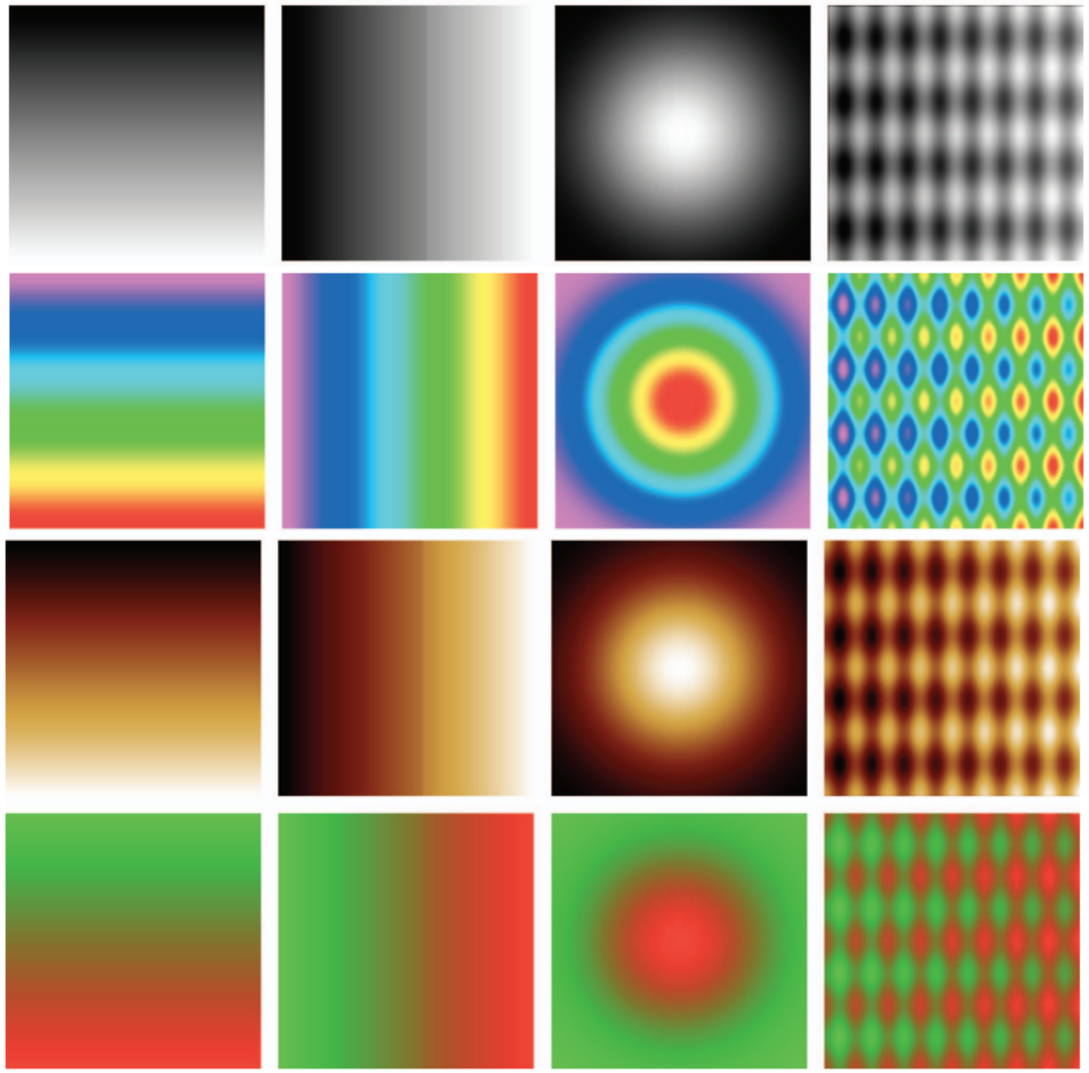

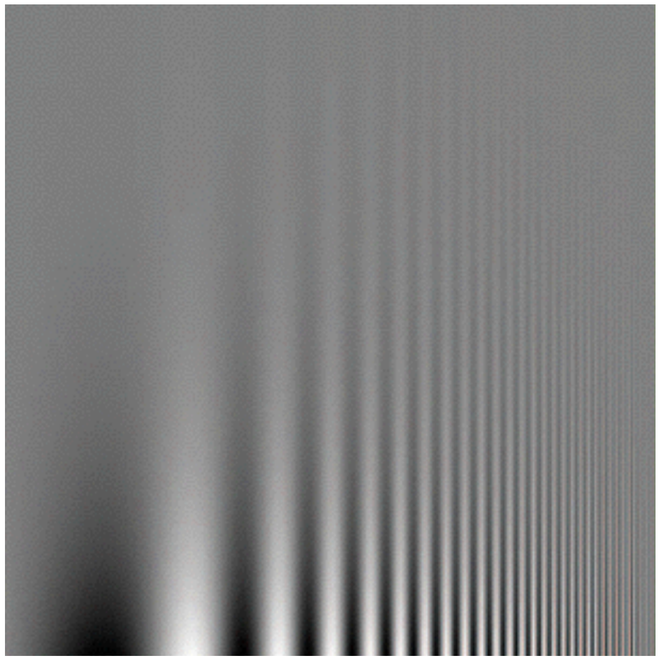

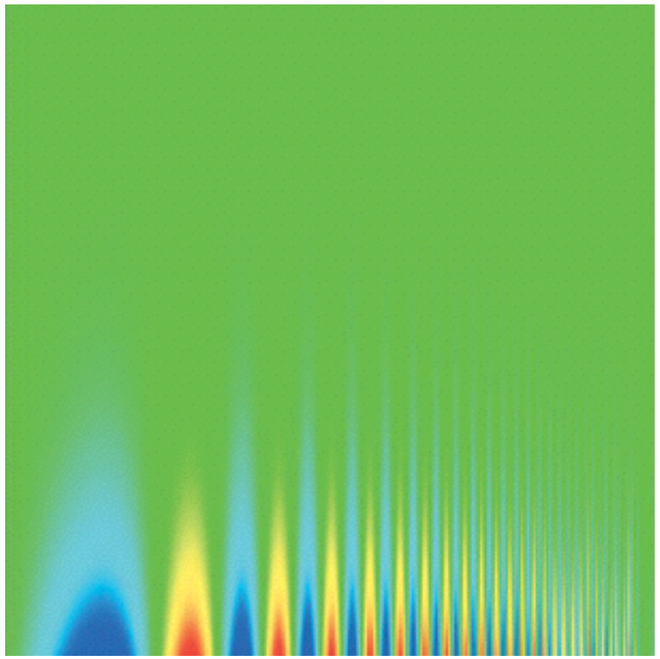

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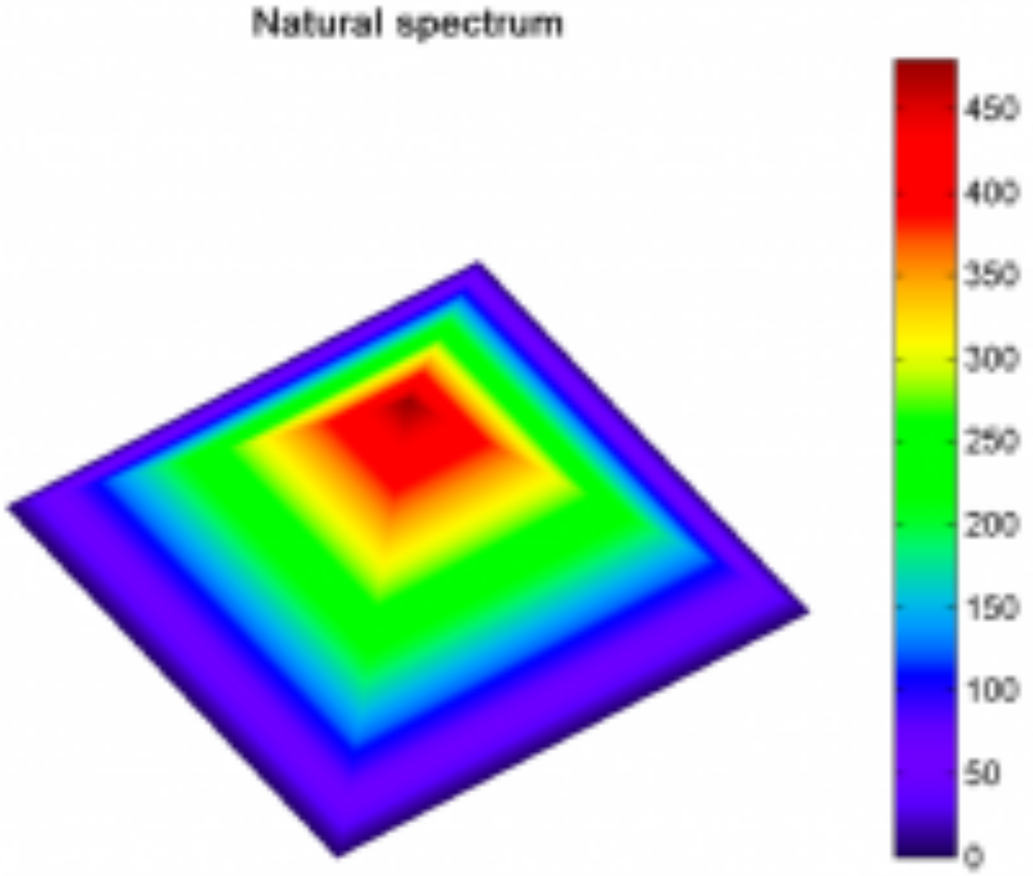

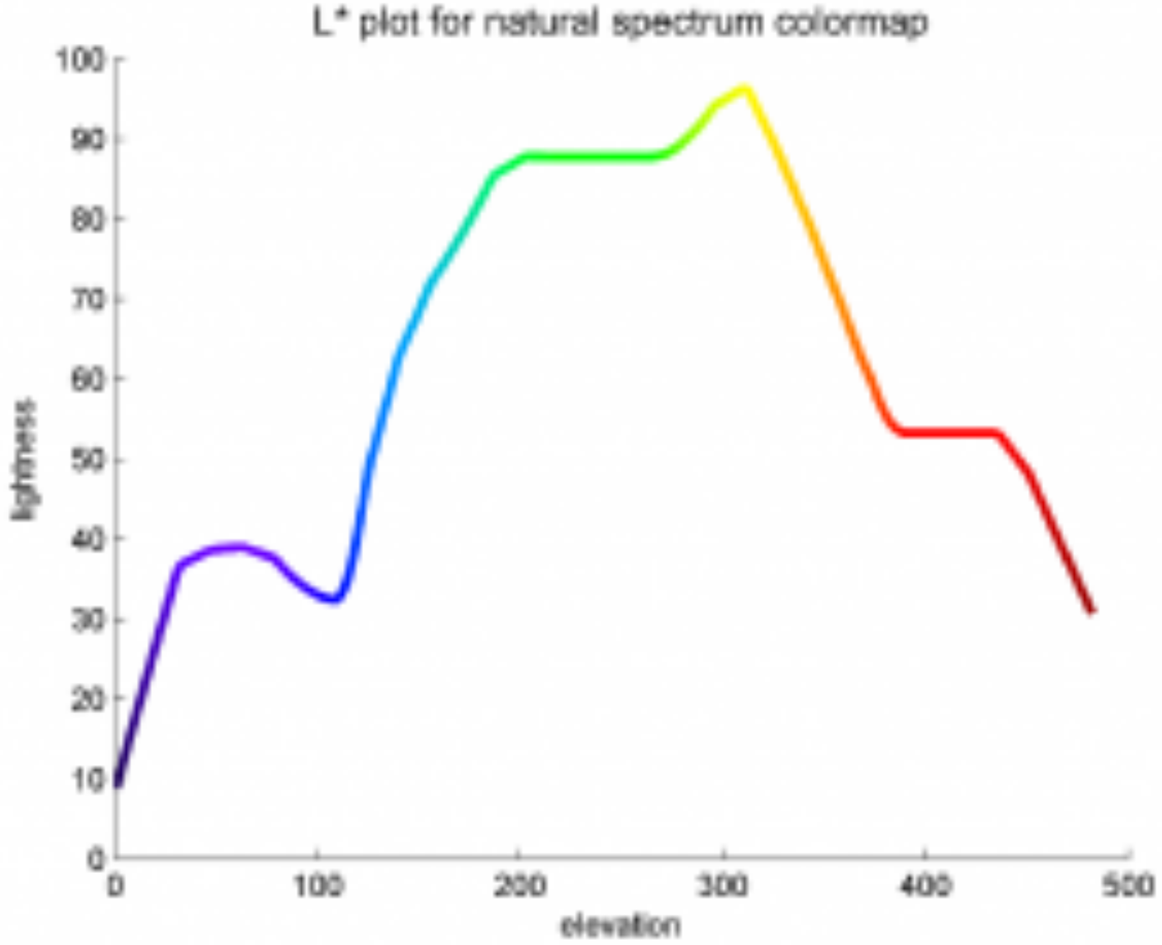

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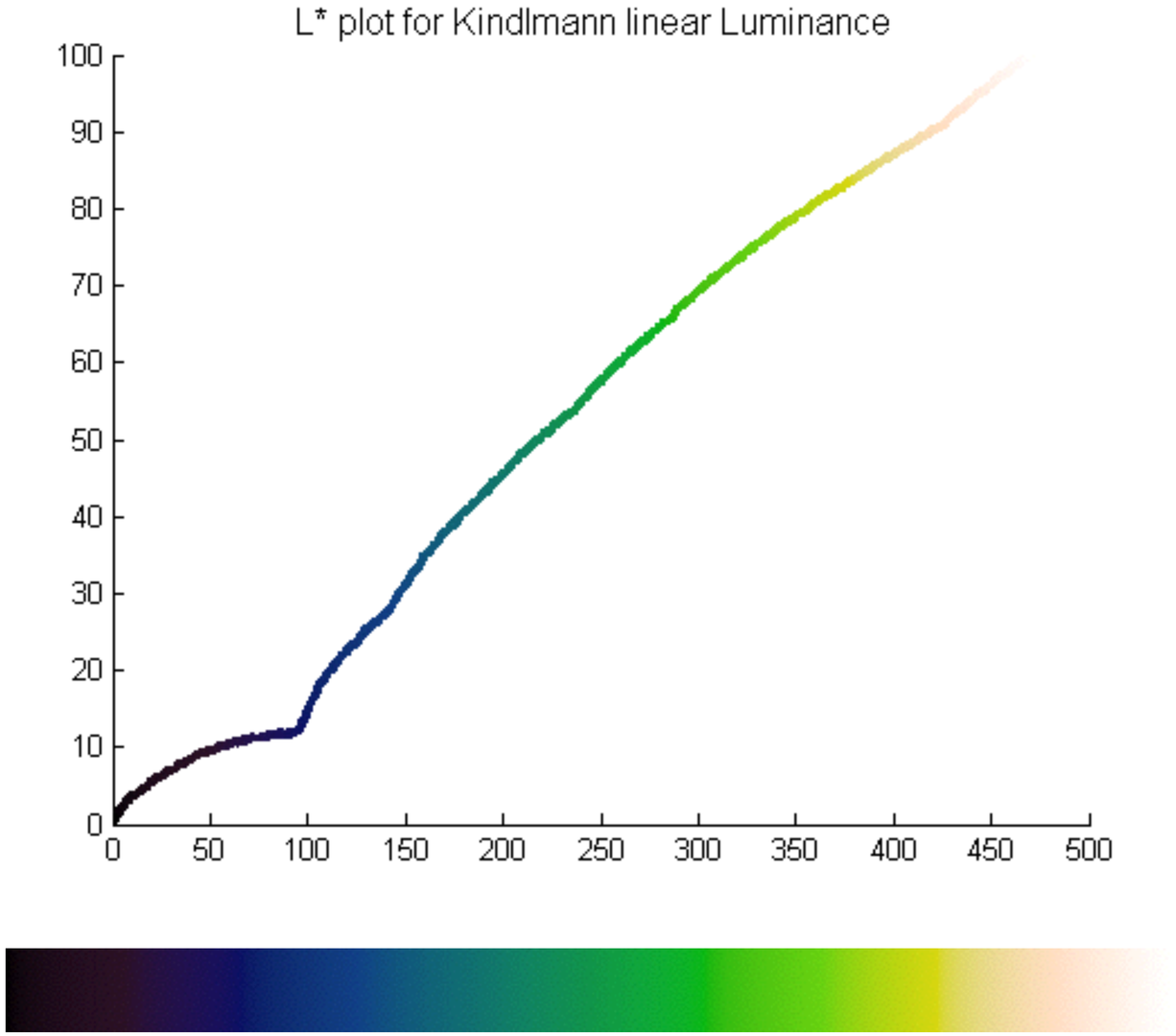

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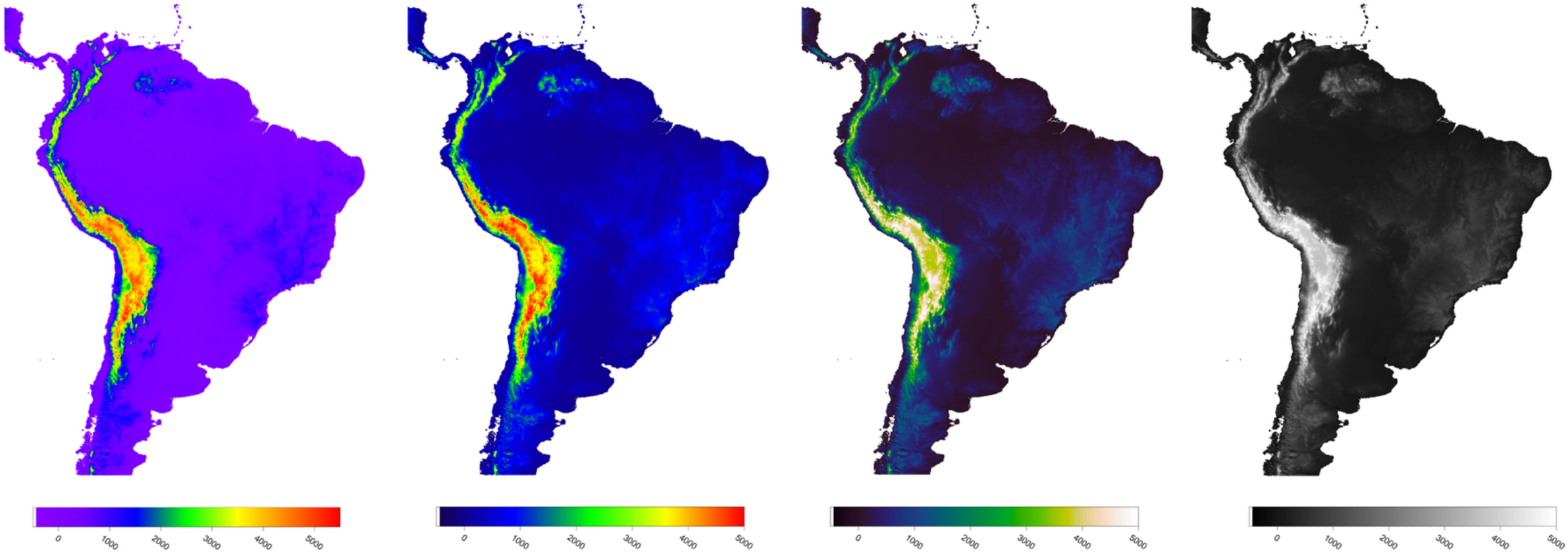

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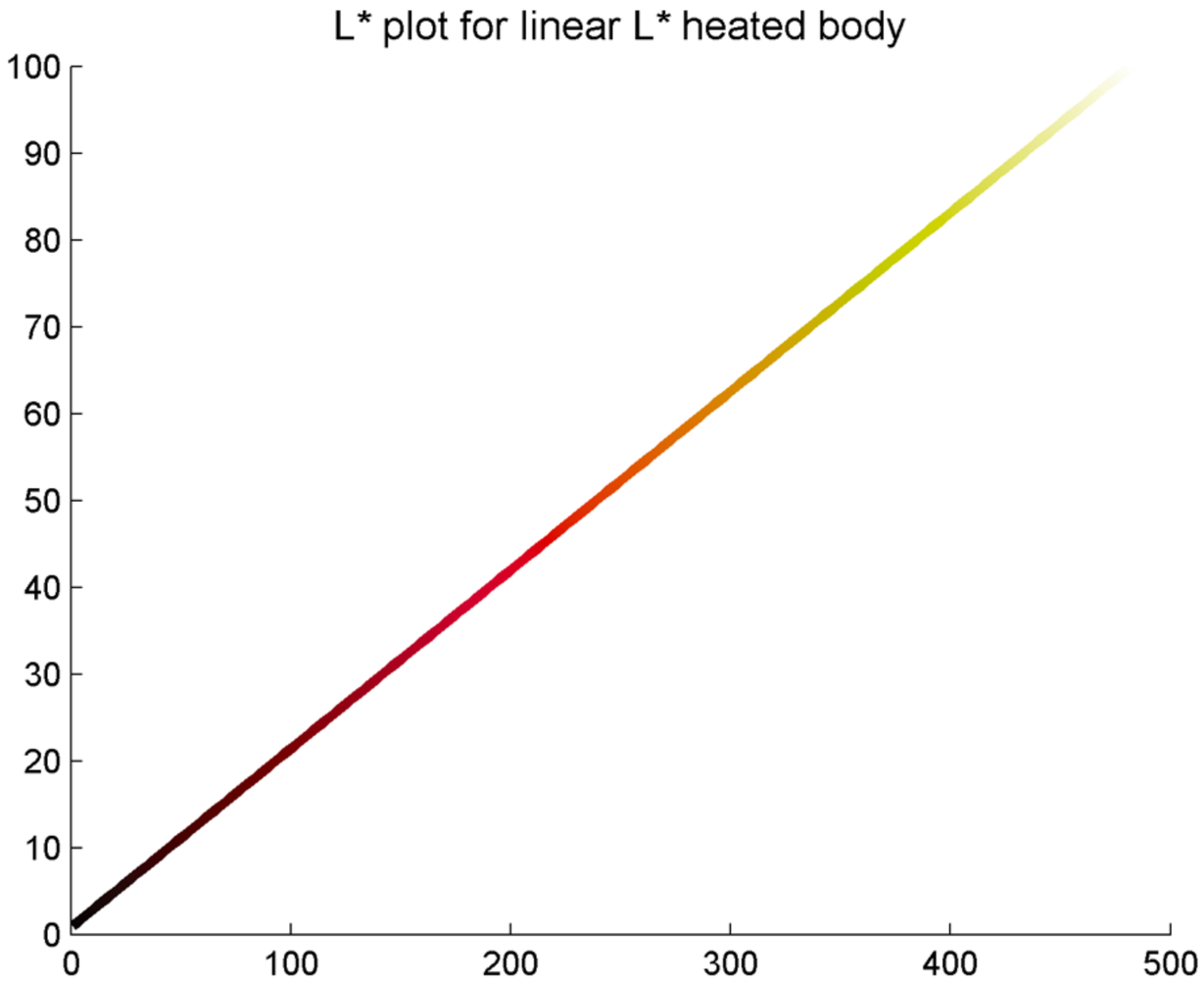
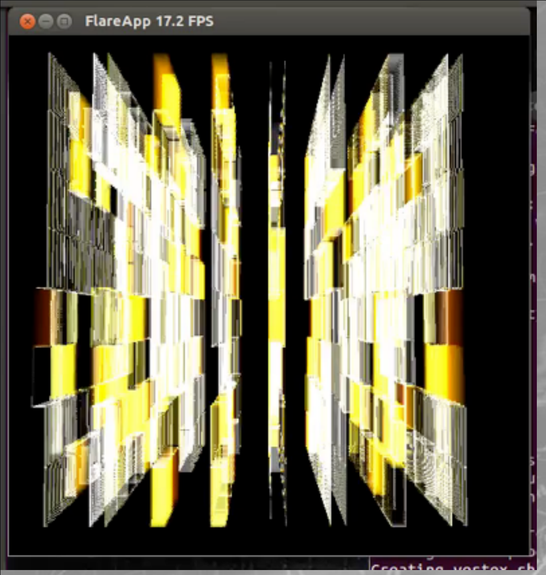
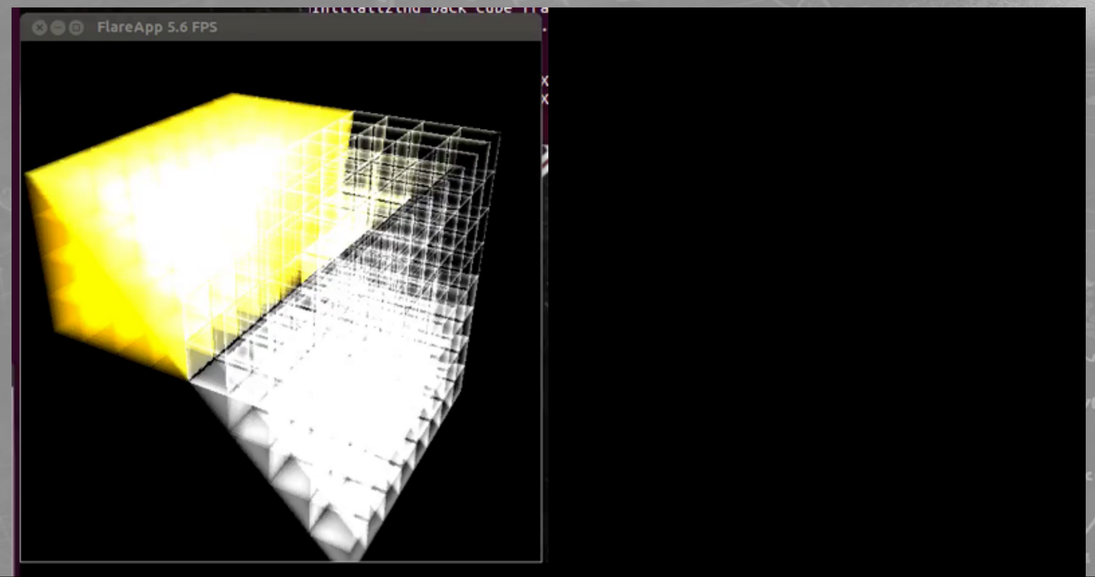




THANK YOU!



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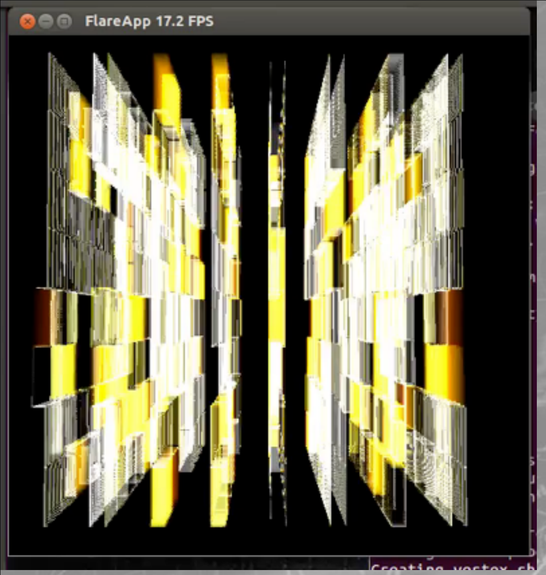
expanding reality

NORRKÖPING VISUALIZATION CENTER

CRESEARCH



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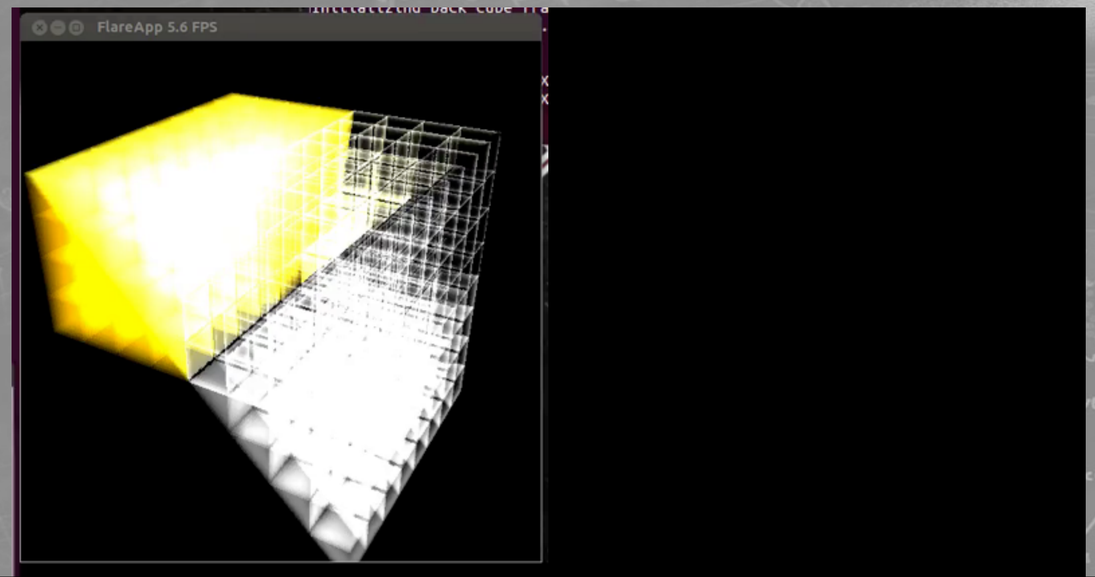

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