



CALIFORNIA
ACADEMY OF
SCIENCES

Ryan Wyatt, Director

Morrison Planetarium and Science Visualization

California Academy of Sciences

Computational Astrophysics 2014–2020 • 21 March 2014

PUBLIC OUTREACH USING VISUALIZATION

AMERICAN MUSEUM OF NATURAL HISTORY



RYAN WYATT

Science Visualizer

Rose Center for Earth and Space

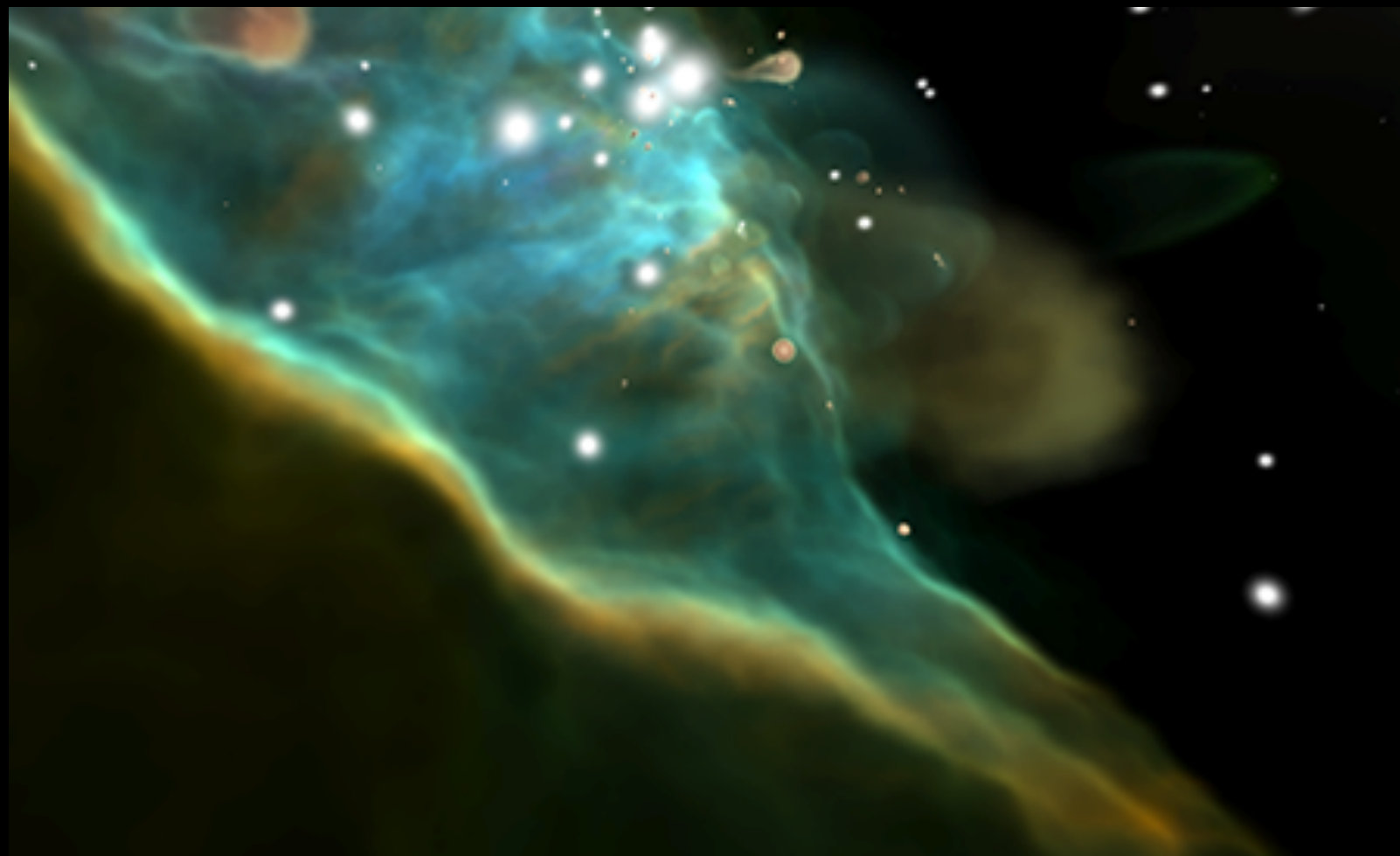
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New York, New York 10024-5192

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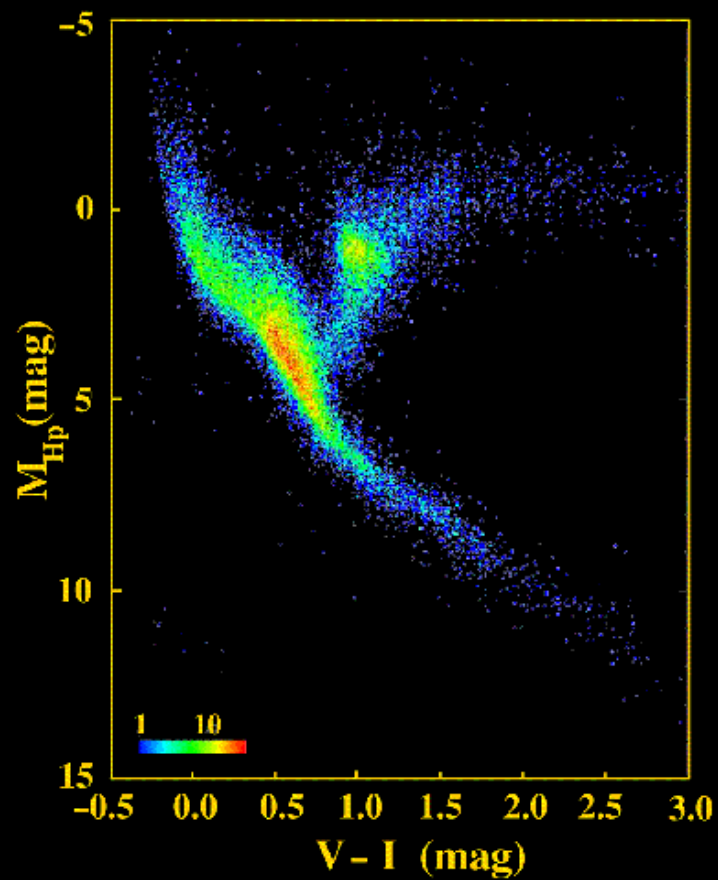
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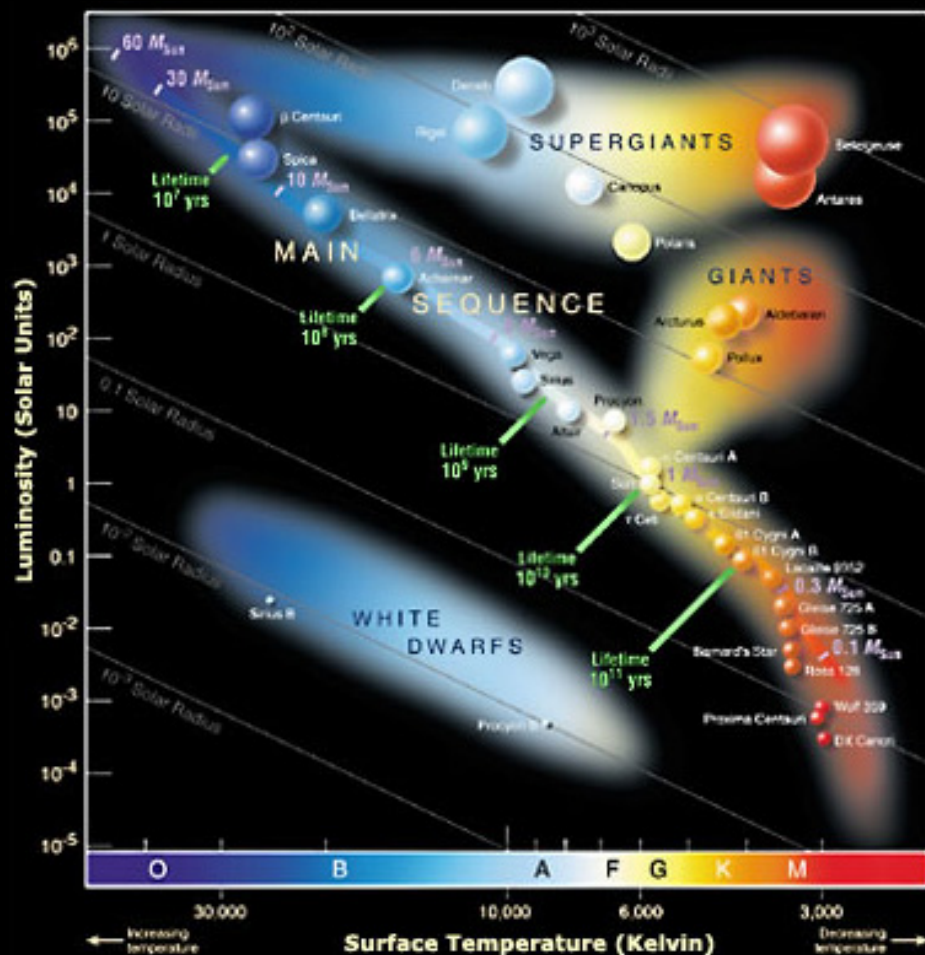


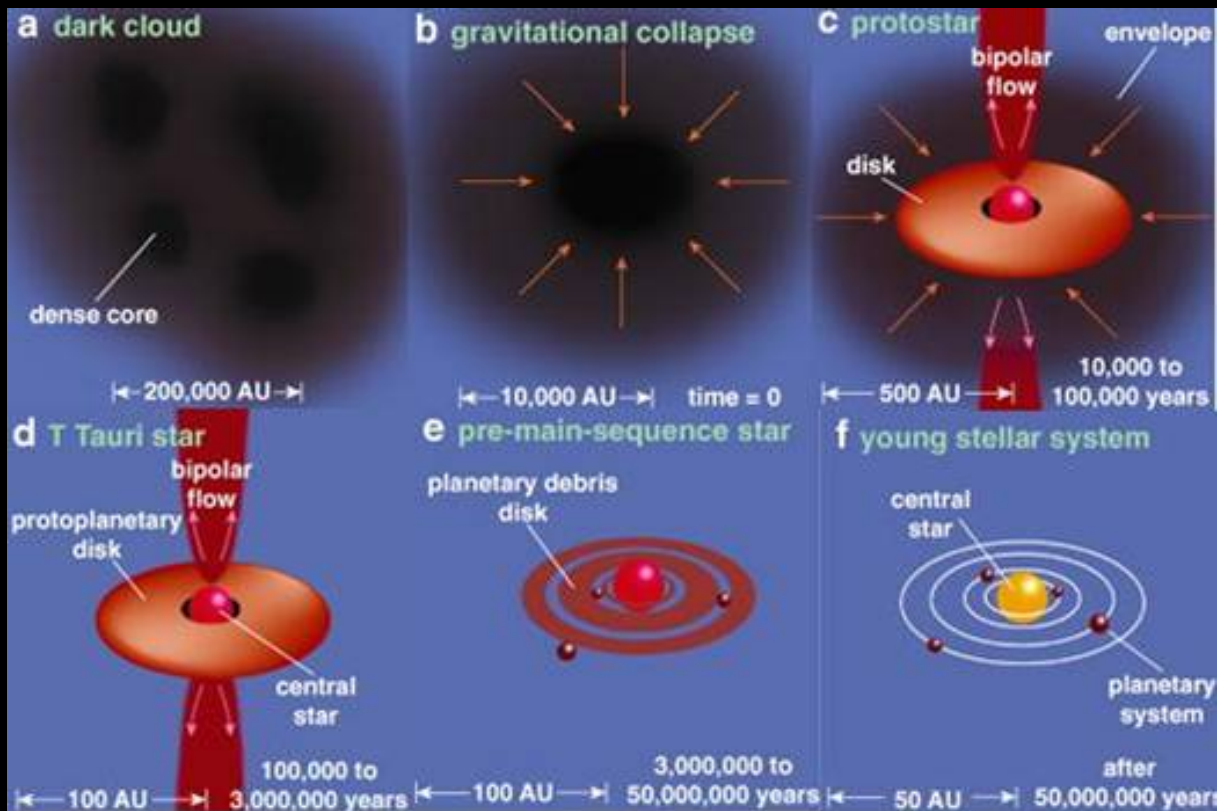




Hertzsprung - Russell: ($\sigma_{\pi} / \pi < 0.2$)







Visualization Is Communication

Communication to oneself—basically, data analysis

Communication to peers

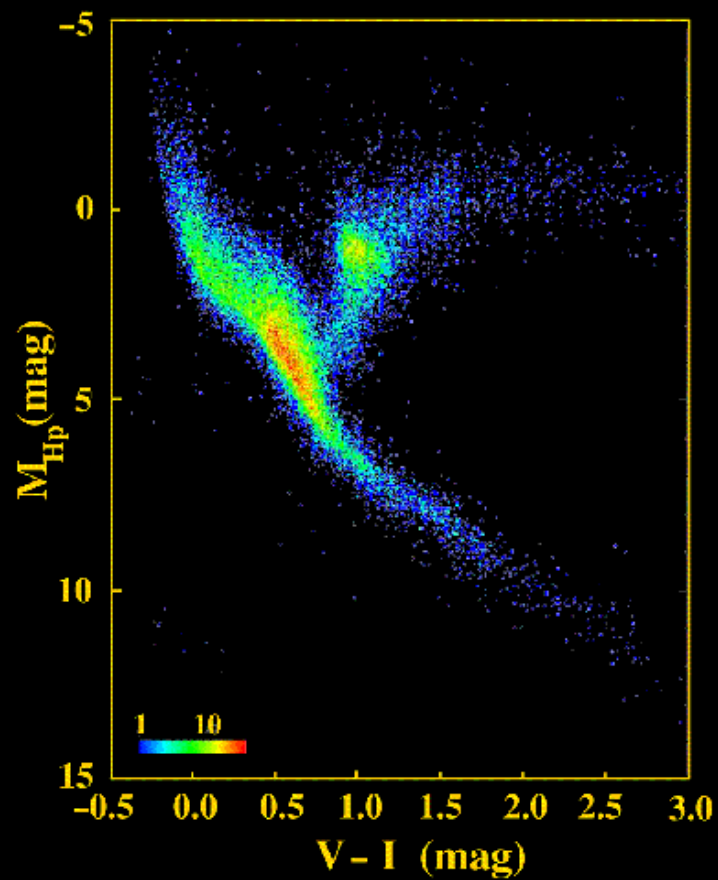
Communication to a general audience

Furthermore, as with all means of communication, all visuals incorporate an element of subjectivity; there is no objective image.

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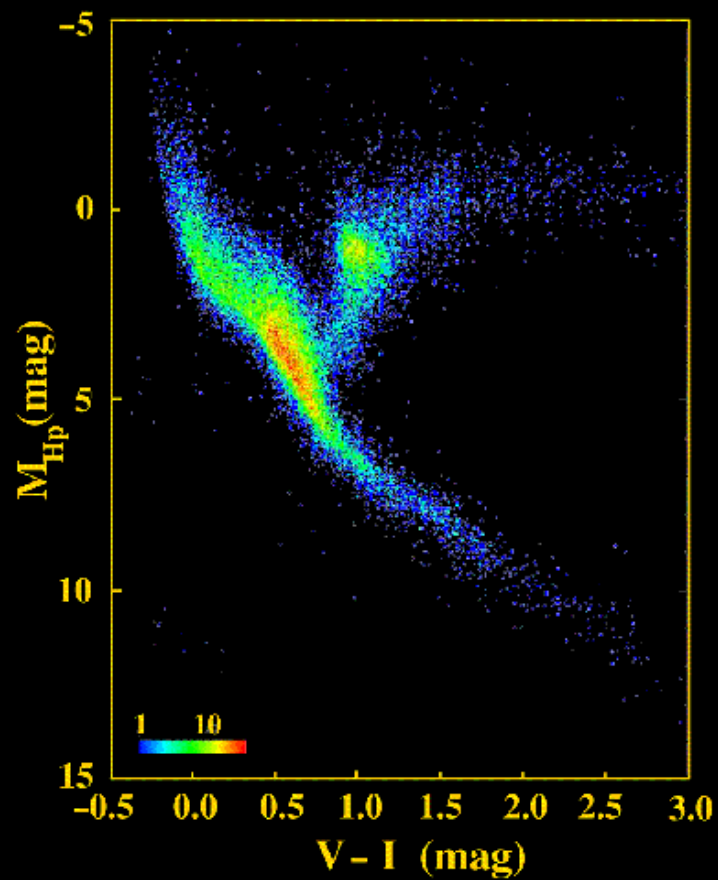


Hertzsprung - Russell: ($\sigma_{\pi} / \pi < 0.2$)

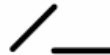
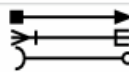




Hertzsprung - Russell: ($\sigma_{\pi} / \pi < 0.2$)

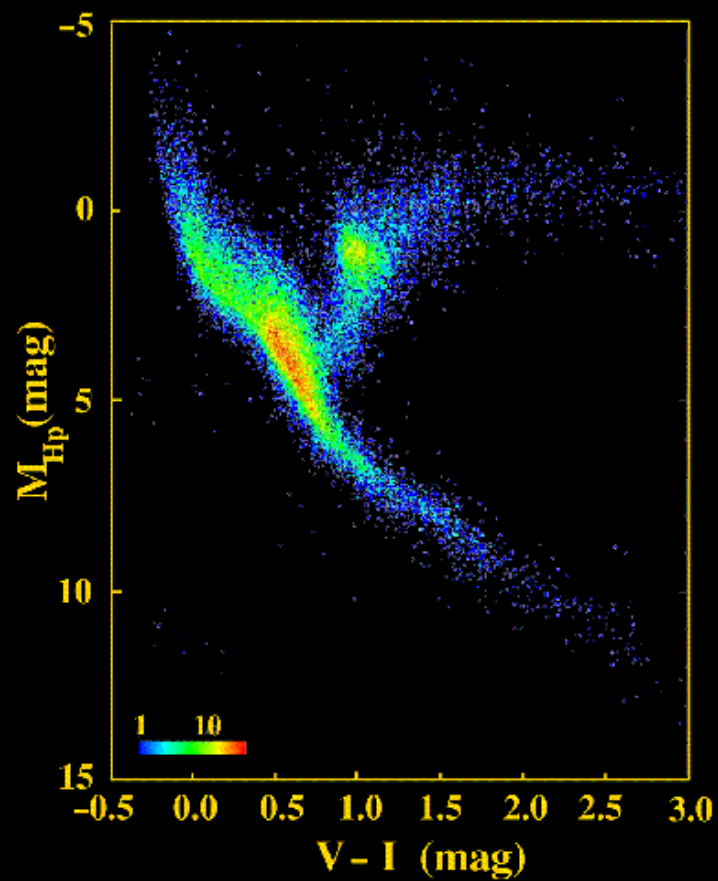


Properties and Best Uses of Visual Encodings

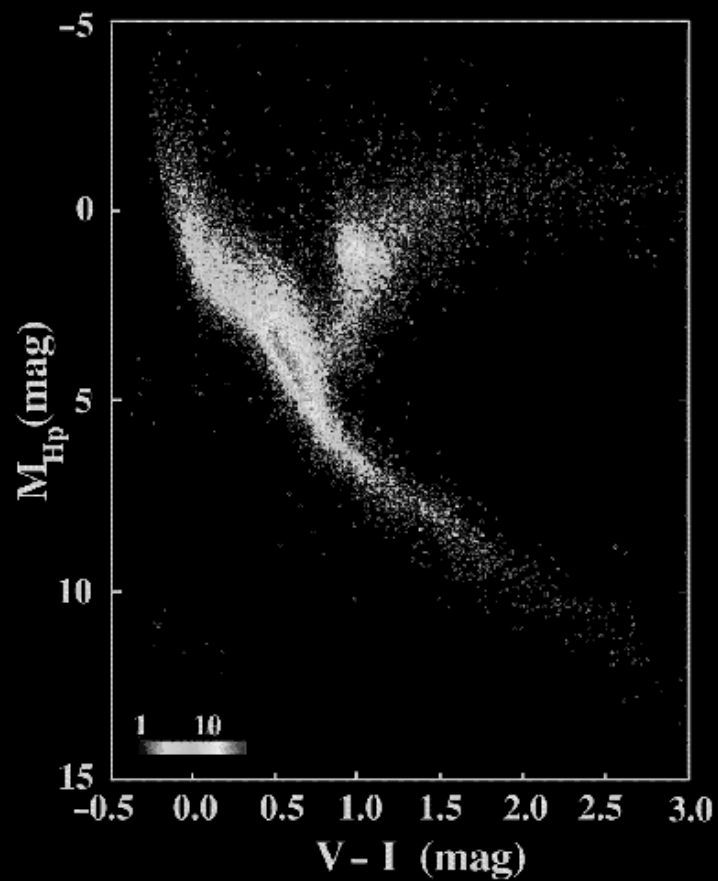
Example	Encoding	Ordered	Useful values	Quantitative	Ordinal	Categorical	Relational
	position, placement	yes	infinite	Good	Good	Good	Good
1, 2, 3; A, B, C	text labels	optional (alphabetical or numbered)	infinite	Good	Good	Good	Good
	length	yes	many	Good	Good		
	size, area	yes	many	Good	Good		
	angle	yes	medium/few	Good	Good		
	pattern density	yes	few	Good	Good		
	weight, boldness	yes	few		Good		
	saturation, brightness	yes	few		Good		
	color	no	few (< 20)			Good	
	shape, icon	no	medium			Good	
	pattern texture	no	medium			Good	
	enclosure, connection	no	infinite			Good	Good
	line pattern	no	few				Good
	line endings	no	few				Good
	line weight	yes	few		Good		



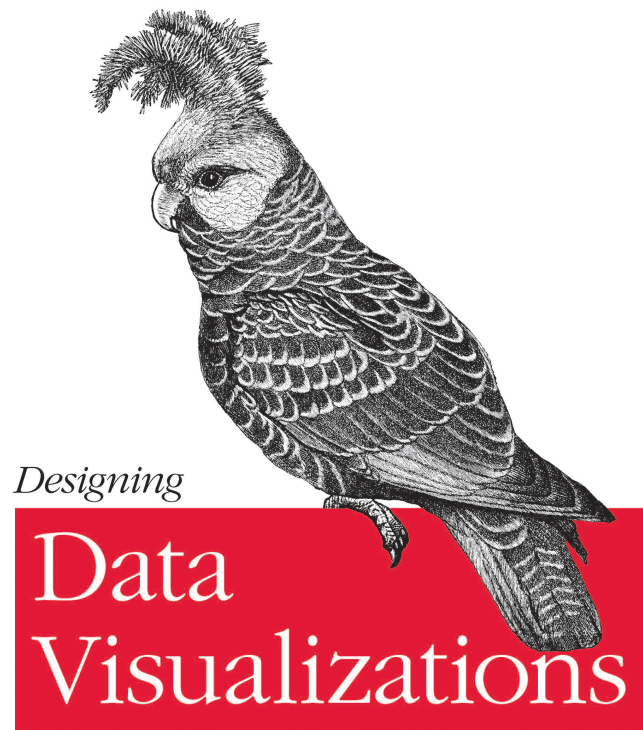
Hertzsprung - Russell: ($\sigma_{\pi} / \pi < 0.2$)



Hertzsprung - Russell: ($\sigma_{\pi} / \pi < 0.2$)



Intentional Communication from Data to Display

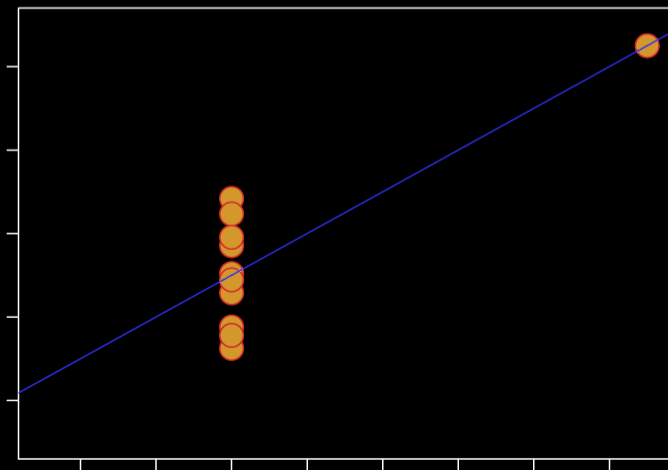
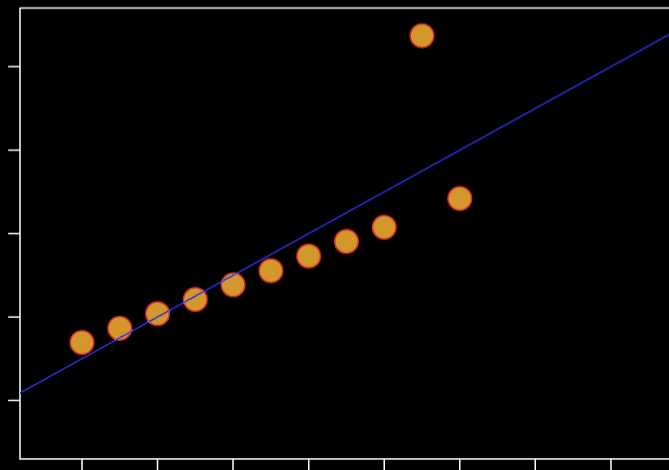
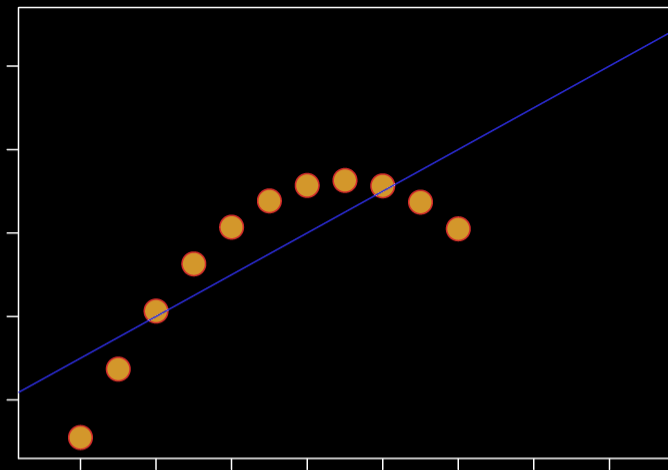
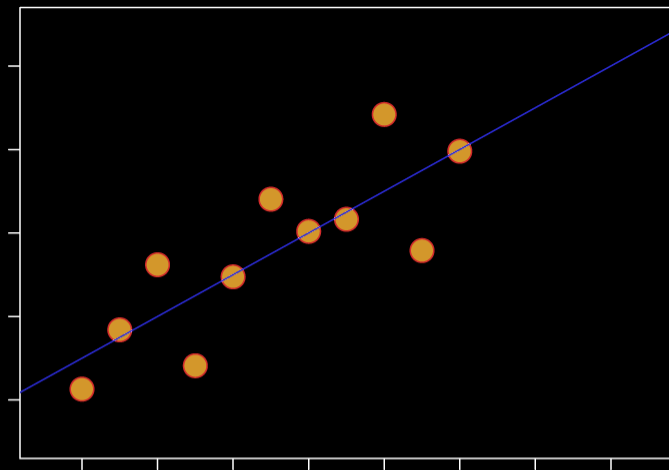


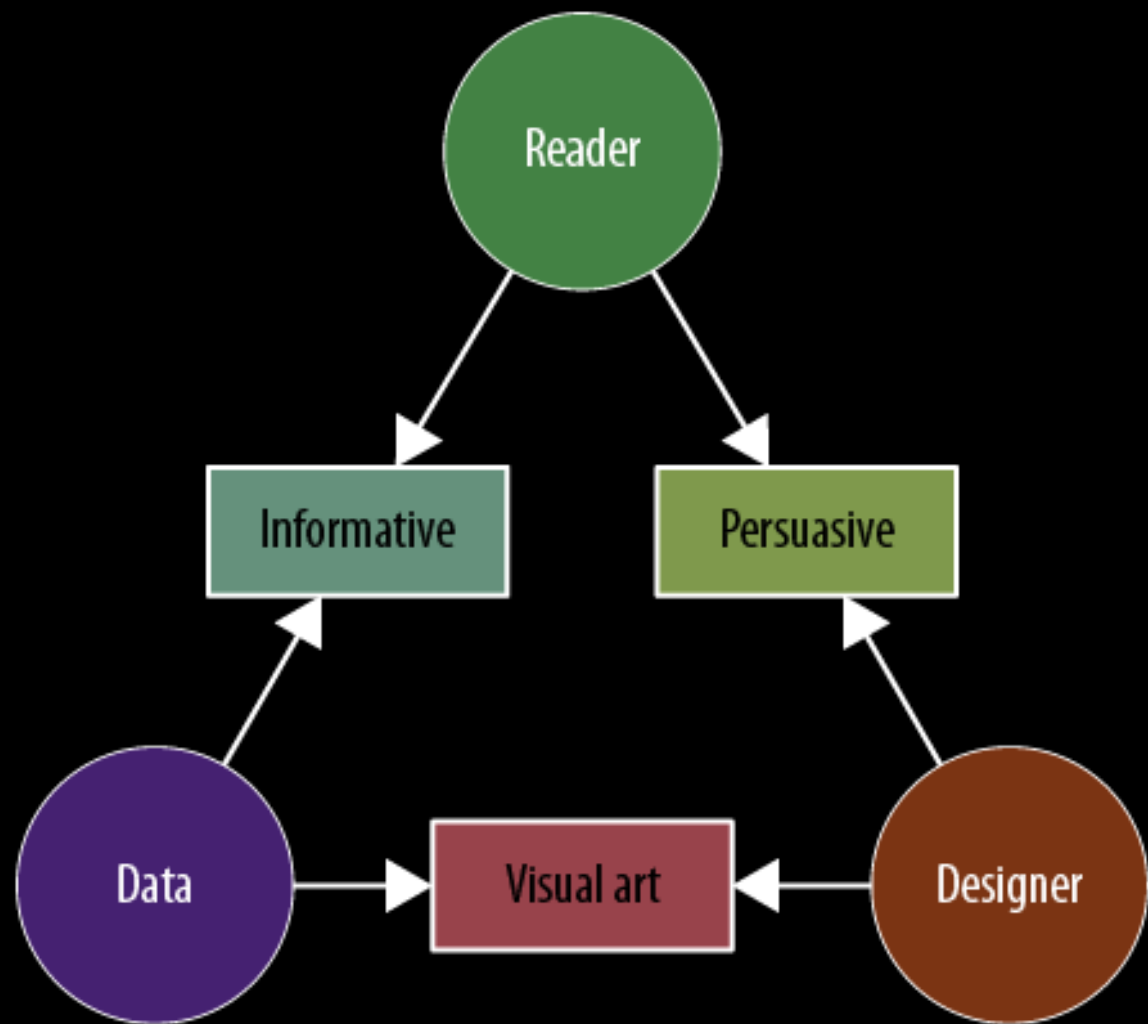
Designing

Data Visualizations

O'REILLY®

Noah Iliinsky & Julie Steele







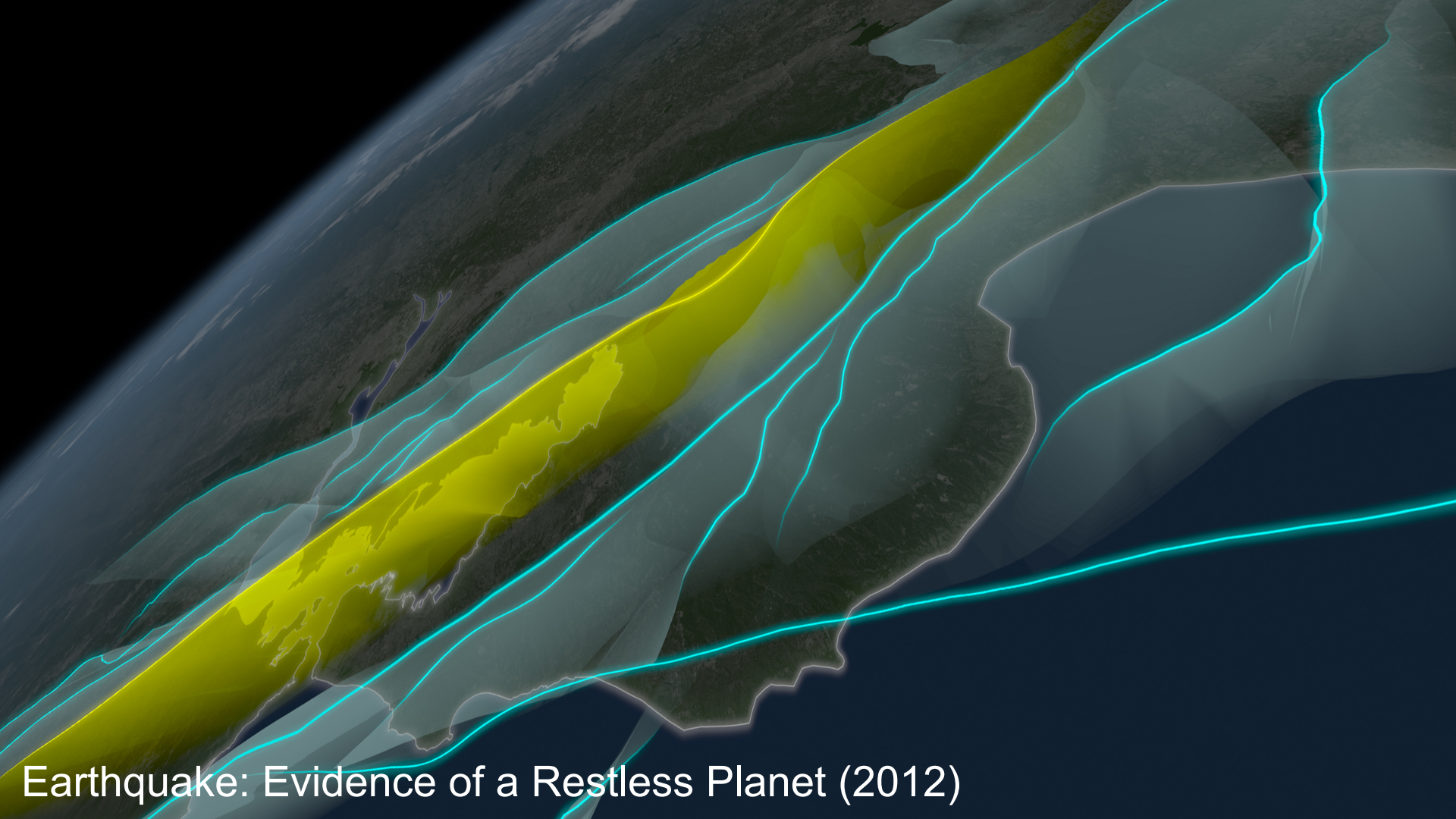


The background of the image is a dark, textured field representing the cosmic web. It features a complex network of thin, grey, filamentary structures that crisscross the frame. Scattered throughout this network are numerous small, bright yellow and orange points of light, which represent galaxies and star clusters. The overall effect is one of a vast, mysterious, and intricate universe.

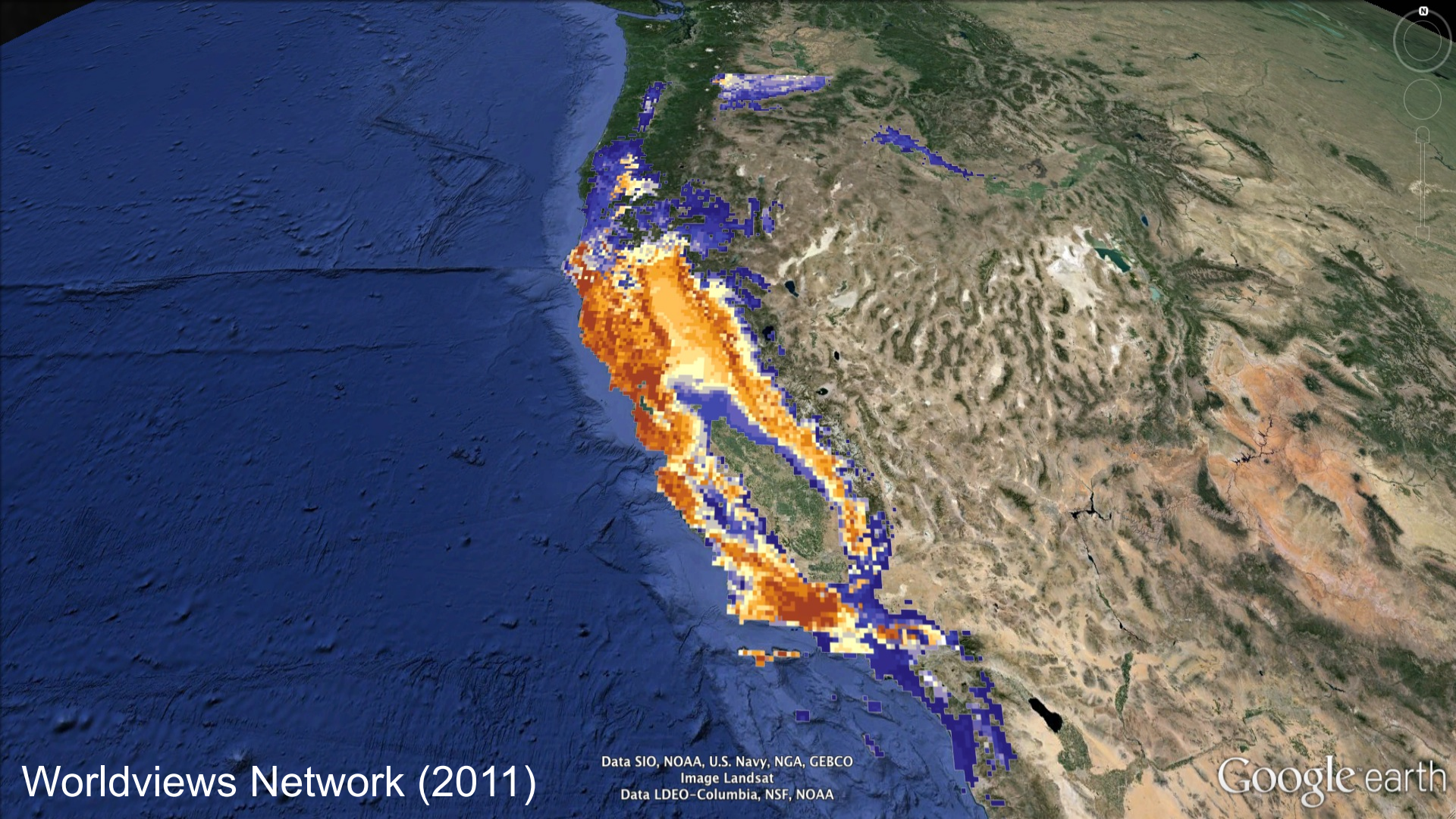
DARK UNIVERSE



Life: A Cosmic Story (2010)



Earthquake: Evidence of a Restless Planet (2012)



Worldviews Network (2011)

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat
Data LDEO-Columbia, NSF, NOAA

Google earth









SCIENCE IN ACTION BEYOND THE HEADLINES

Current story: Elephants' Extreme Communication

Up next: Volcanic Ash

Beginning in: 00:02:28



SCIENCE IN ACTION
Short stories
on science news

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SCIENCE IN ACTION Beyond the Headlines

Current Stories:

Volcanic Ash (Run Time - 1:36)

Oil Spill Effects (3:50)

E. coli Art (1:44)

Elephants' Extreme Communication (2:13)

PROGRA



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Images courtesy the California Academy of Sciences Archives and Visualization Studio



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