



ITN 215212: Black Hole Universe



# How to give a good talk

Tomaso Belloni (INAF-OAB)



*2010 July 8th*



*Thierry Lombry*



# The talk

- Use technology
- Slide background
- Colors. Highlights.
- Fonts
- Put stuff in your slides



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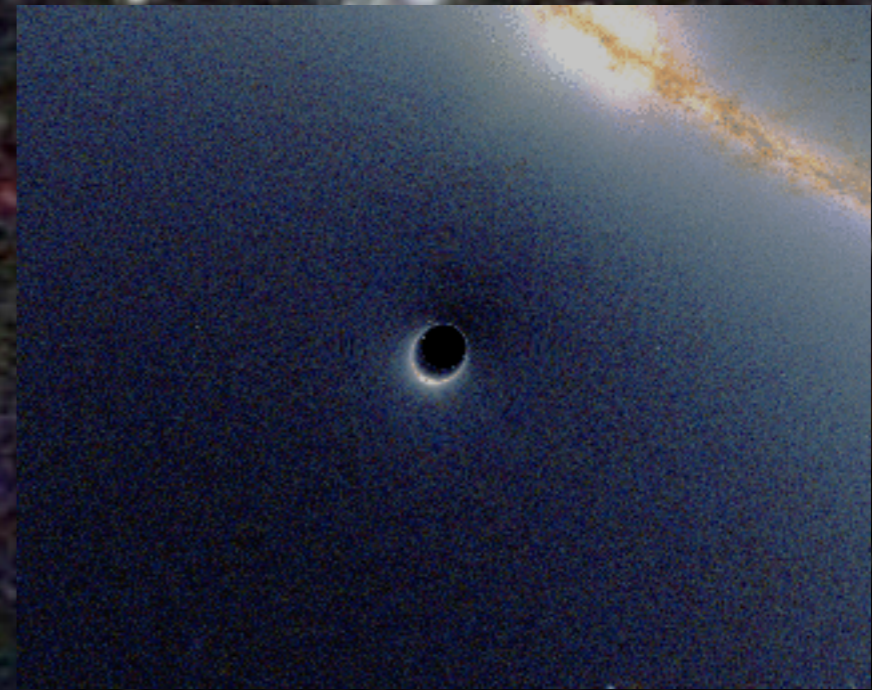


# The talk

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In general relativity, a black hole is a region of space in which the gravitational field is so powerful that nothing, including light, can escape its pull. The black hole has a one-way surface, called an event horizon, into which objects can fall, but out of which nothing can come. It is called "black" because it absorbs all the light that hits it, reflecting nothing, just like a perfect blackbody in thermodynamics. Quantum analysis of black holes shows them to possess a temperature and Hawking radiation. Despite its invisible interior, a black hole can reveal its presence through interaction with other matter. A black hole can be inferred by tracking the movement of a group of stars that orbit a region in space which looks empty. Alternatively, one can see gas falling into a relatively small black hole, from a companion star. This gas spirals inward, heating up to very high temperature and emitting large amounts of radiation that can be detected from earthbound and earth-orbiting telescopes. Such observations have resulted in the scientific consensus that, barring a breakdown in our understanding of nature, black holes do exist in our universe.



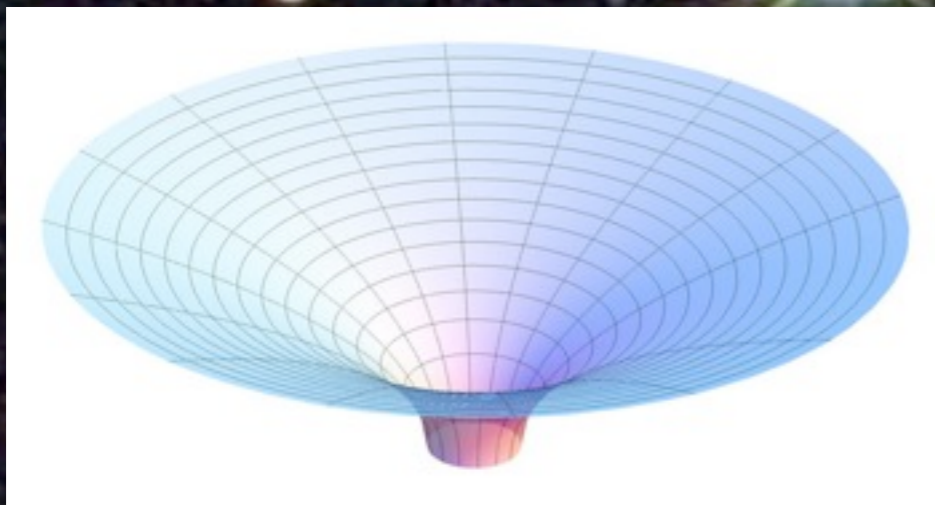
## Example

do exist in our universe?  
first, predicting a phenomenon in our understanding of nature, black  
telescopes, such observations have resulted in the scientific con-  
of radiation that can be detected from earthbound and earth-orbiting

In Einstein's theory of general relativity, the Schwarzschild solution (or the Schwarzschild vacuum) describes the gravitational field outside a spherical, non-rotating mass such as a (non-rotating) star, planet, or black hole. It is also a good approximation to the gravitational field of a slowly rotating body like the Earth or Sun. The cosmological constant is assumed to equal zero.

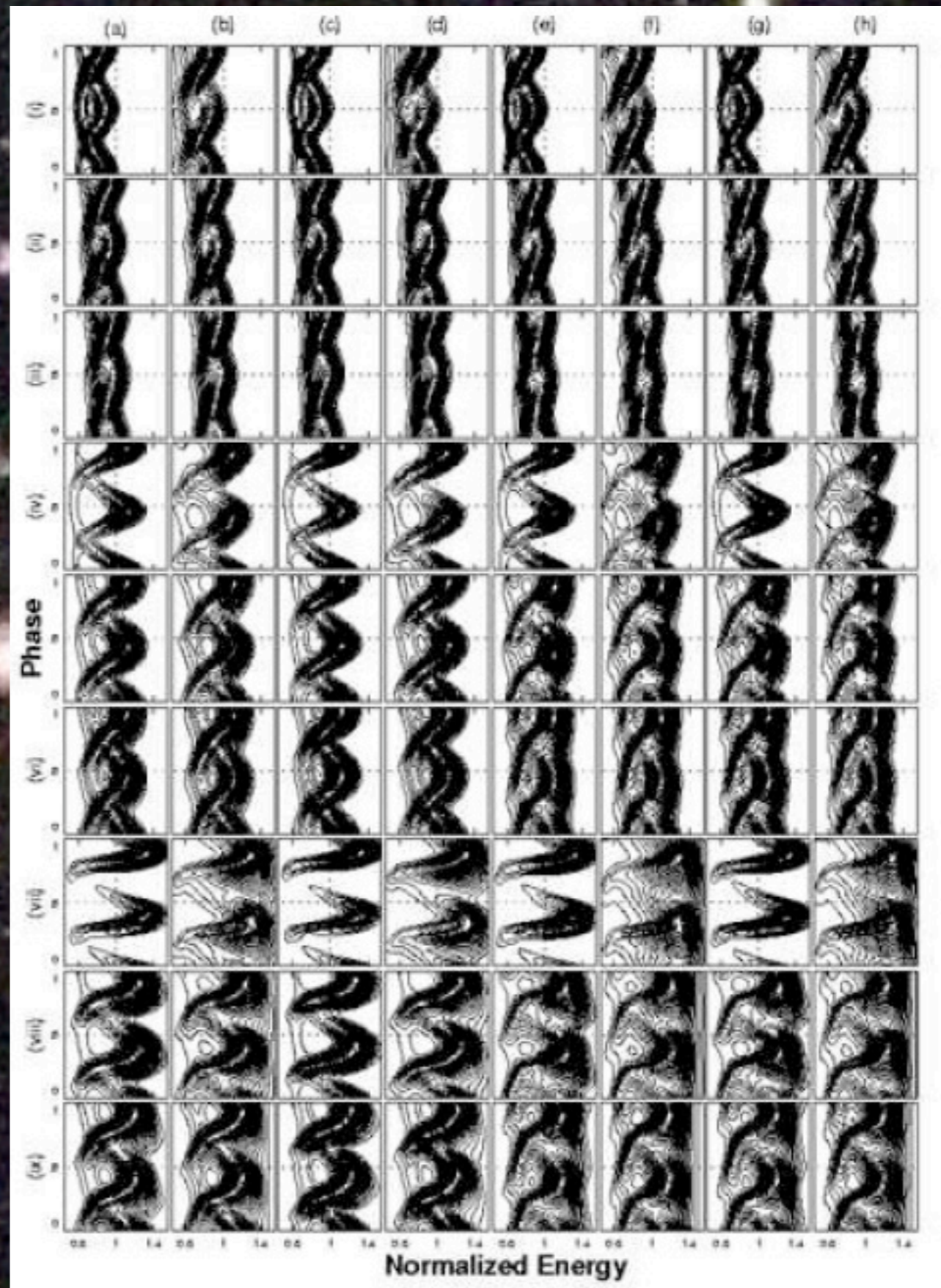
According to Birkhoff's theorem, the Schwarzschild solution is the most general spherically symmetric, vacuum solution of the Einstein field equations. A Schwarzschild black hole or static black hole is a black hole that has no charge or angular momentum. A Schwarzschild black hole has a Schwarzschild metric, and cannot be distinguished from any other Schwarzschild black hole except by its mass.

Schwarzschild black hole except by its mass.  
metric, and cannot be distinguished from any other





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Seriously...



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# How to give a good talk

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# Outline

- General principles
- The slides
- The presentation



# General principles

- Amount of material and # of slides
- Target audience
- Focus on main aim
- “Begin at the beginning and go on till you come to the end: then stop.”
- Slides are not your notes



# Golden principle

*Non multa, sed multo*

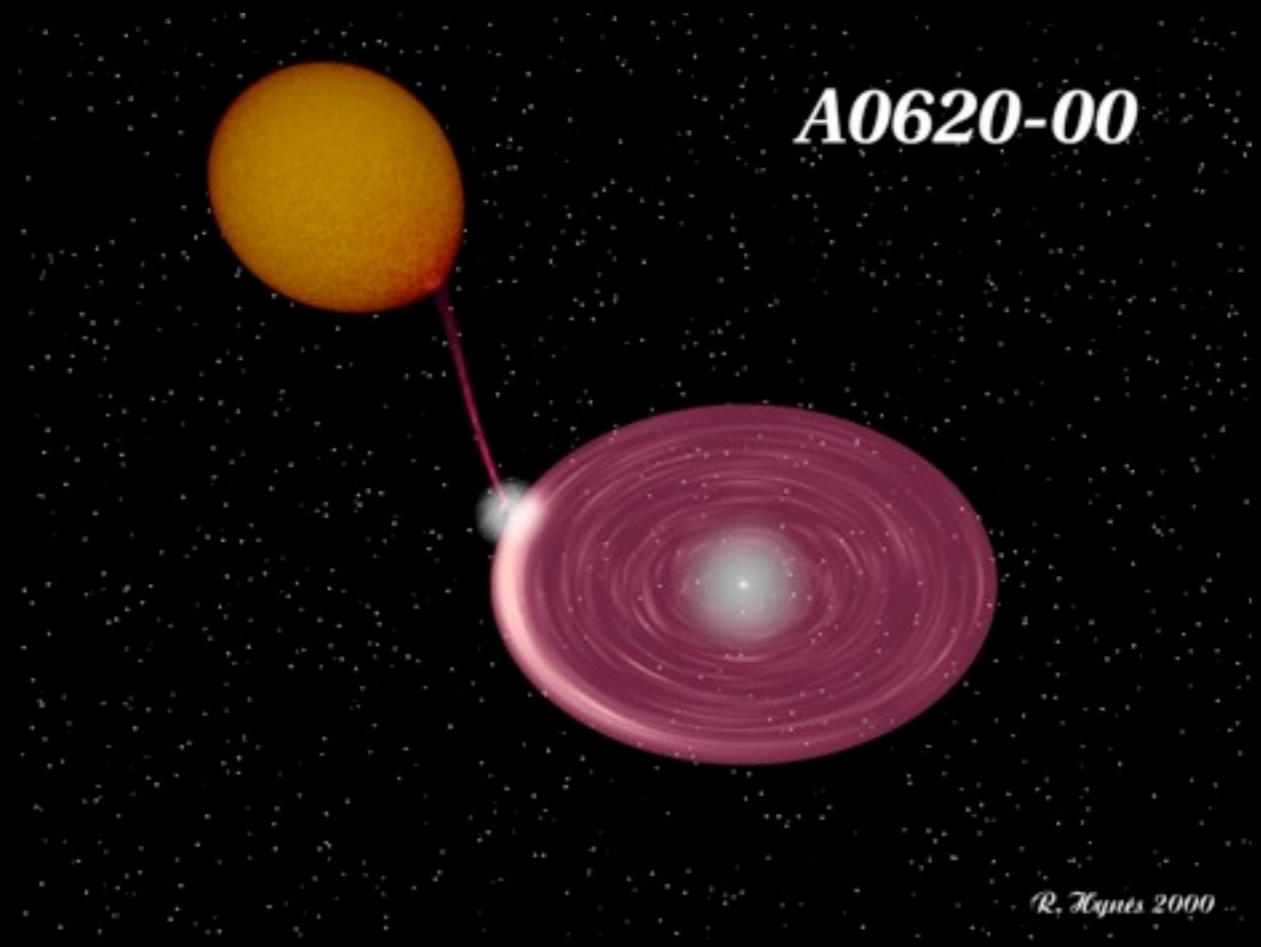
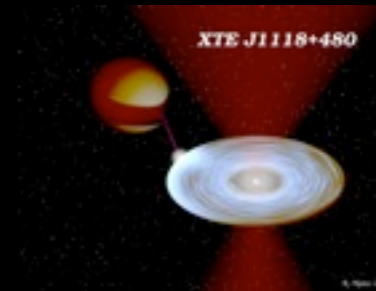
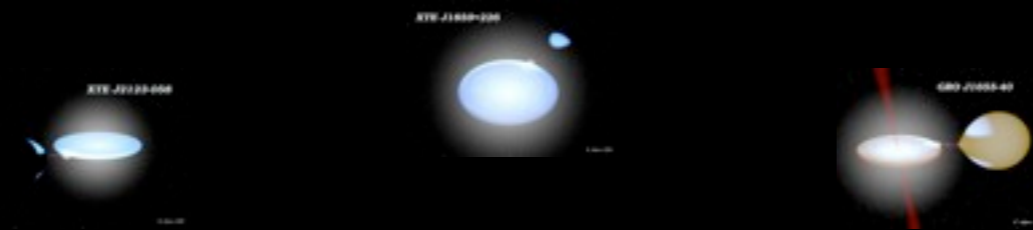
Quintilian (35-96 CE)



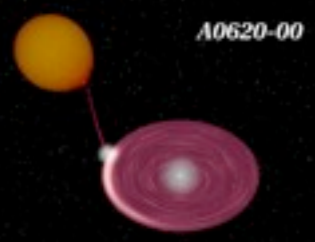
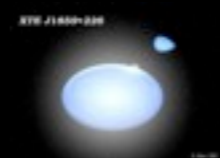
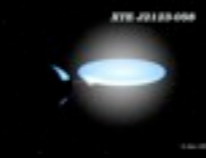
# The slides

- Careful with technology
- Slide background
- Colors. Highlights. Color-blindness
- Fonts
- Animations
- Crowded slides

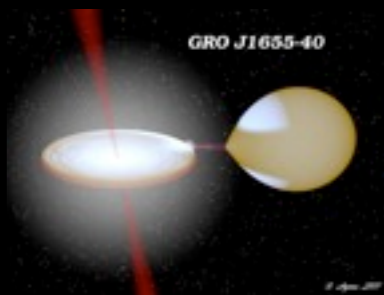




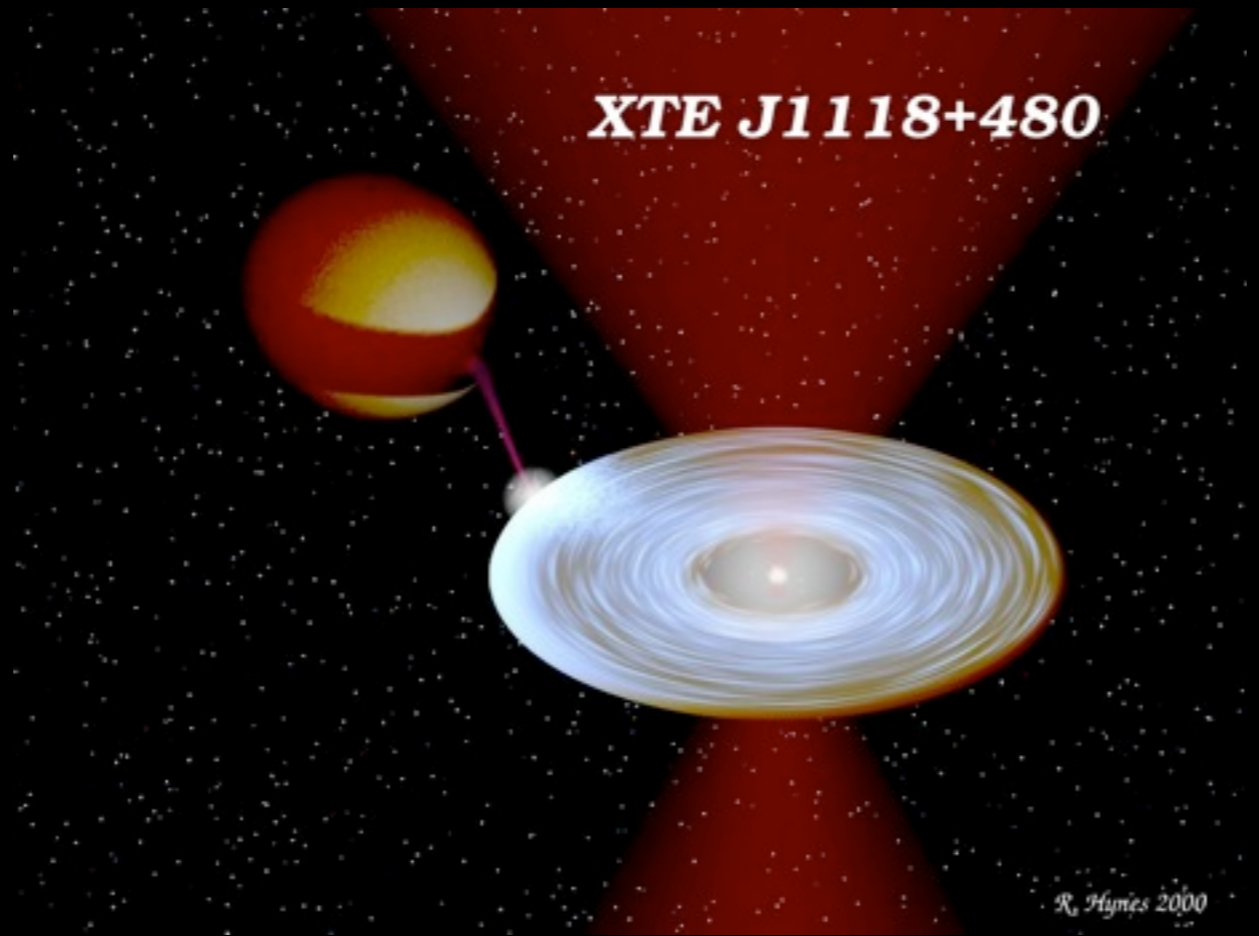




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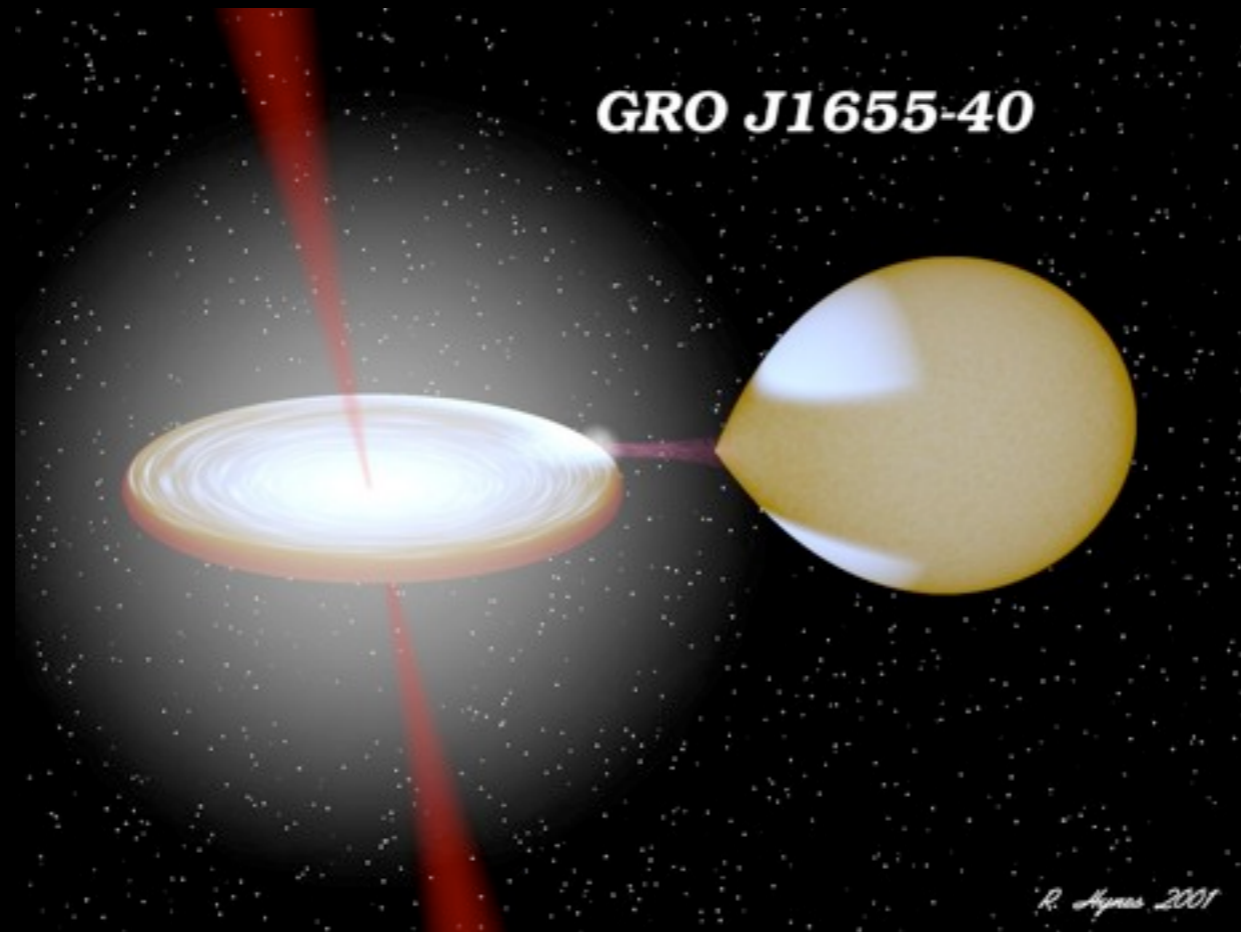
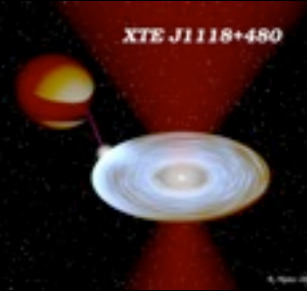
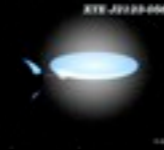
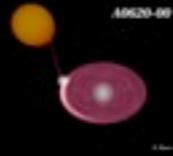
GRO J1655-40



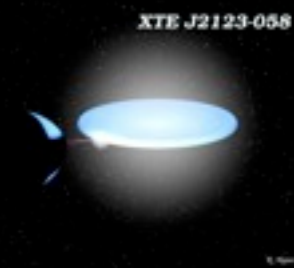
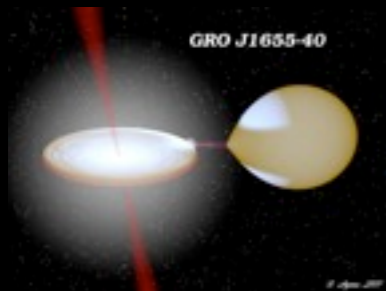
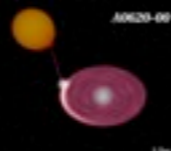
XTE J1118+480

R. Hynes 2000

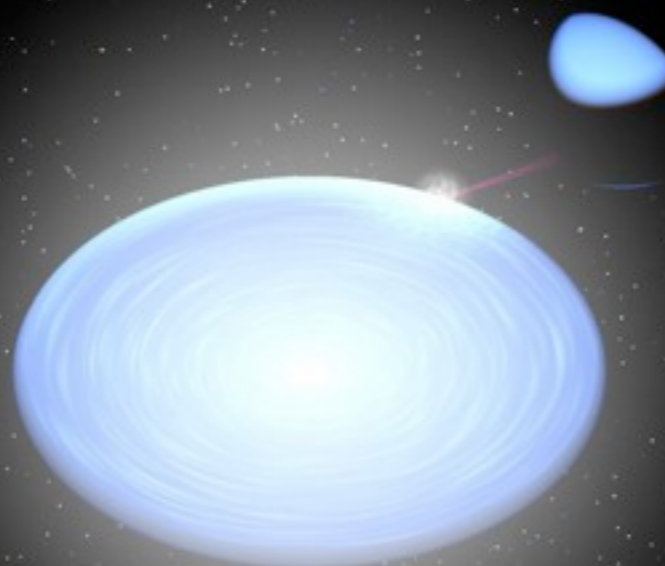






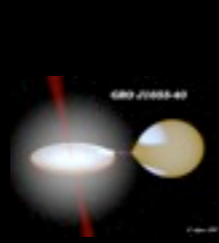


**XTE J1859+226**

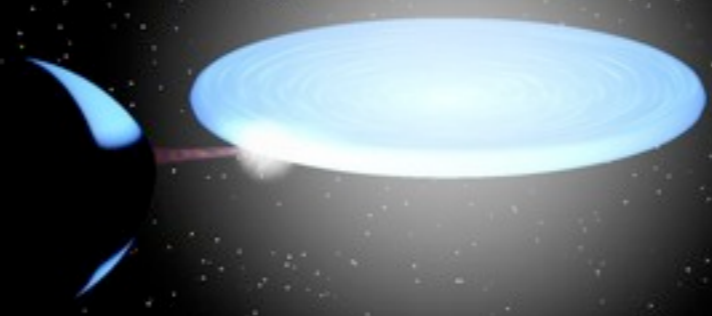


*R. Hynes 2000*



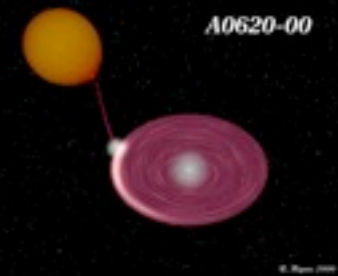
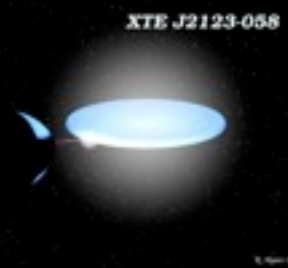
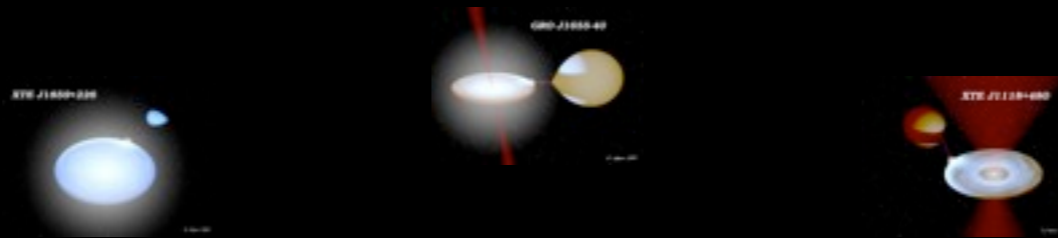


# XTE J2123-058



*R. Hynes 2000*





# The slides

- Careful with technology
- Slide background
- Colors. **Highlights.** **Color-blindness**
- Fonts
- Animations
- Crowded slides



# Background

- ✦ Don't overdo it



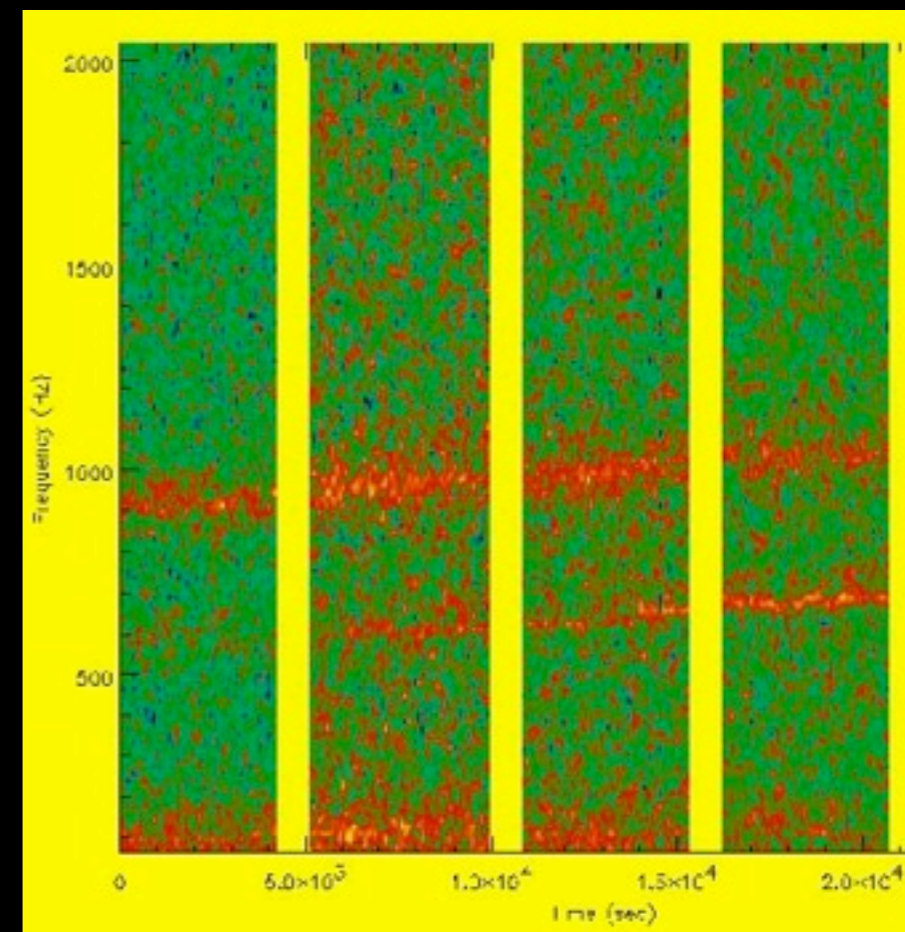
# The slides

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# Careful with colors

- With our IXO observation, we have discovered the first direct evidence of the existence of **god** in the universe, located in a distant galaxy



# The slides

- Careful with technology
- Slide background
- Colors. **Highlights.** **Color-blindness**
- Fonts
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# Fonts

- Keep them simple
- Avoid "Comic Sans MS"
- If you mix fonts, use very different fonts
- Like this one
- Watch out: not everyone has them



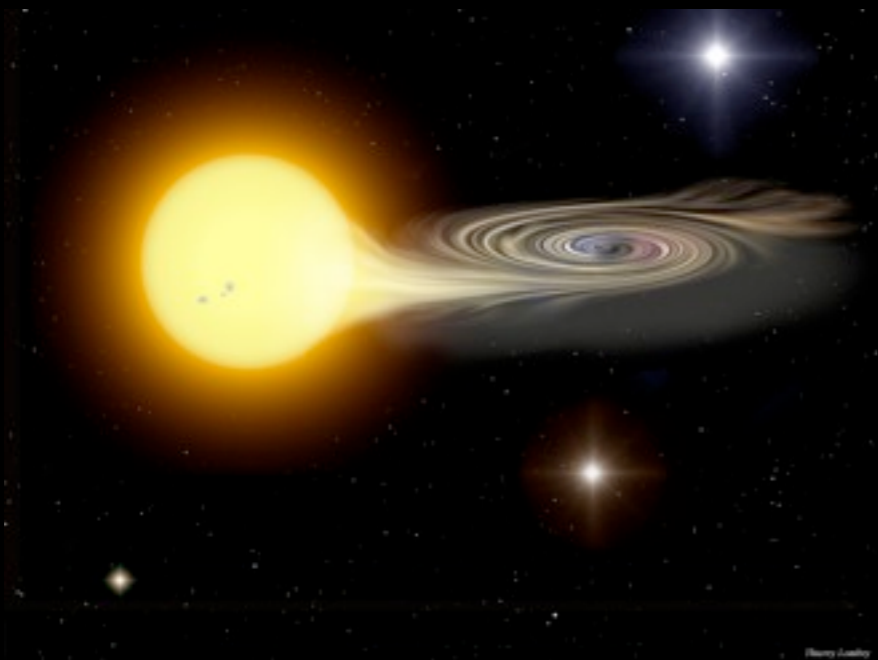
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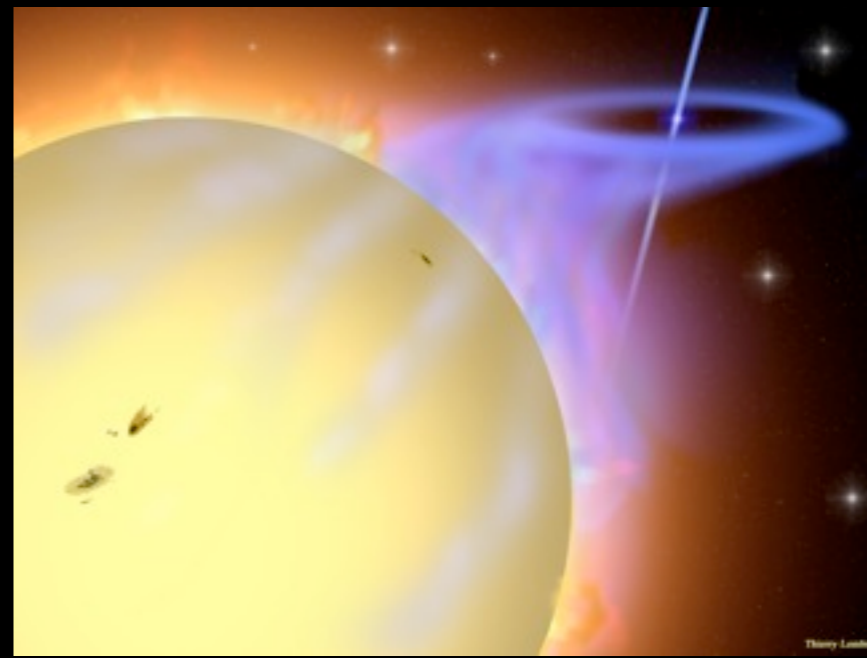
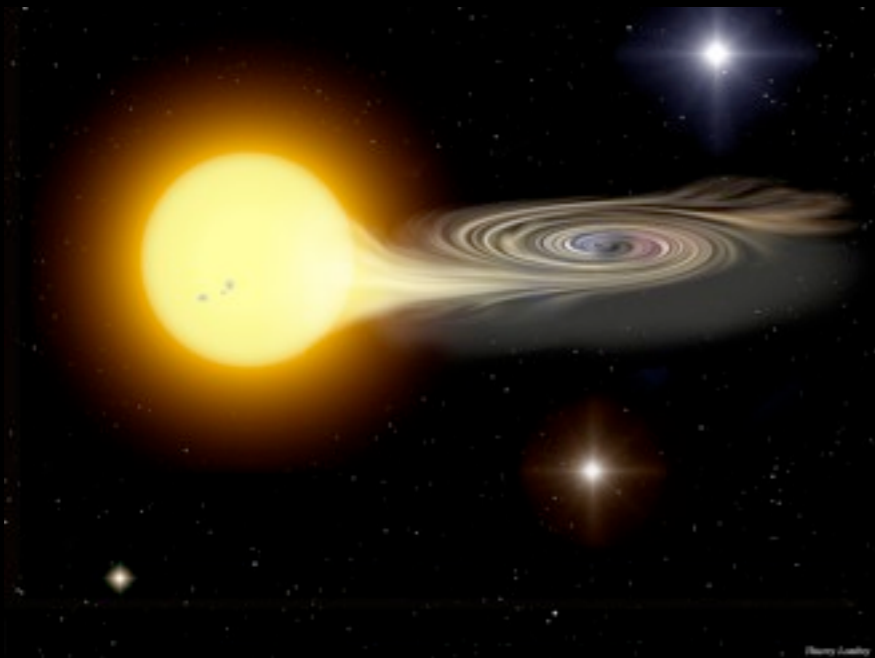
Very careful

# Very careful

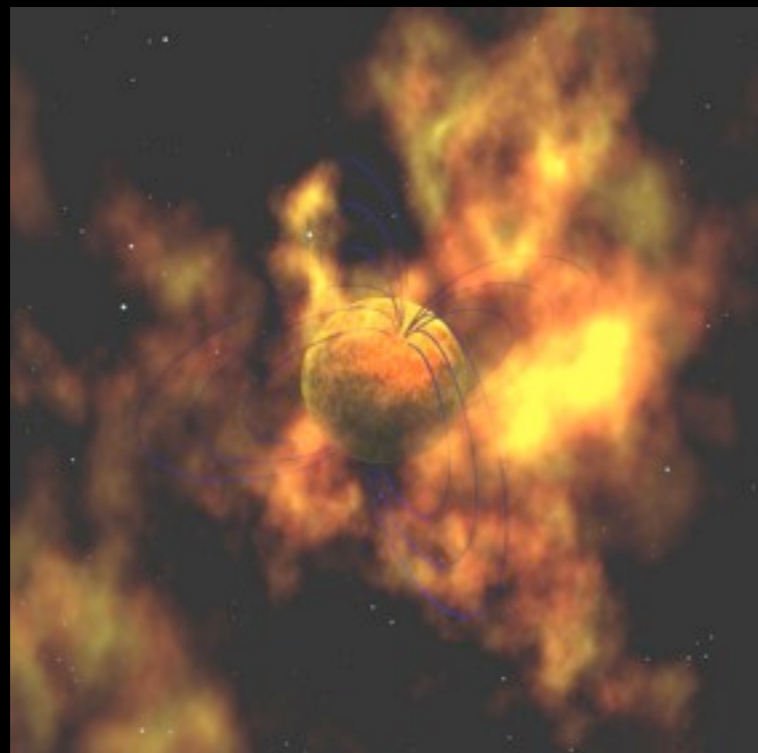
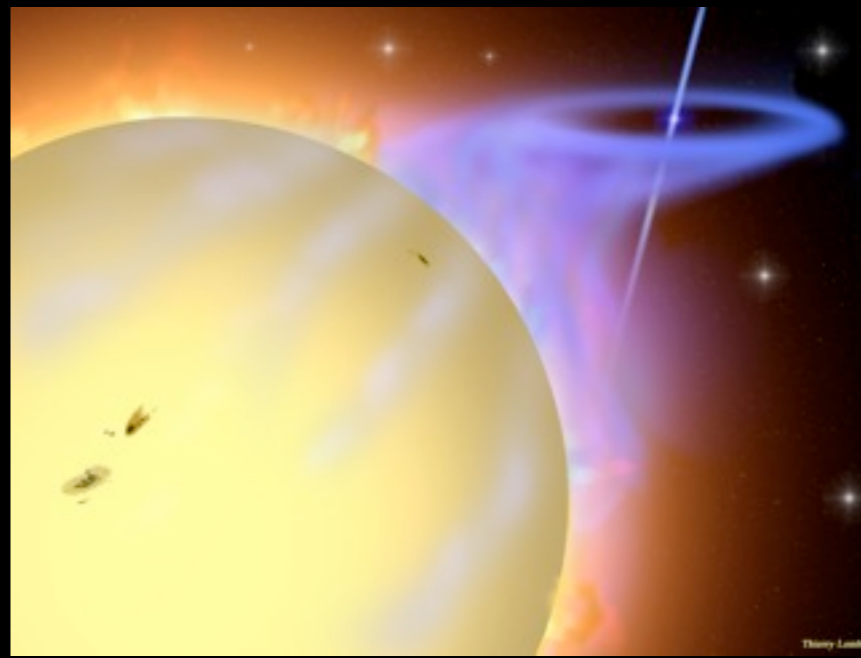




# Very careful

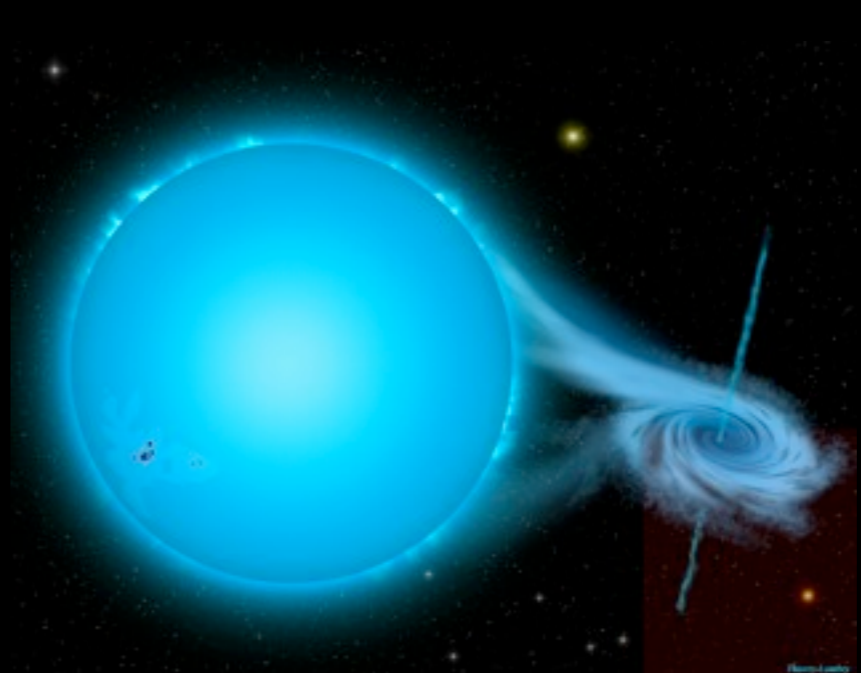
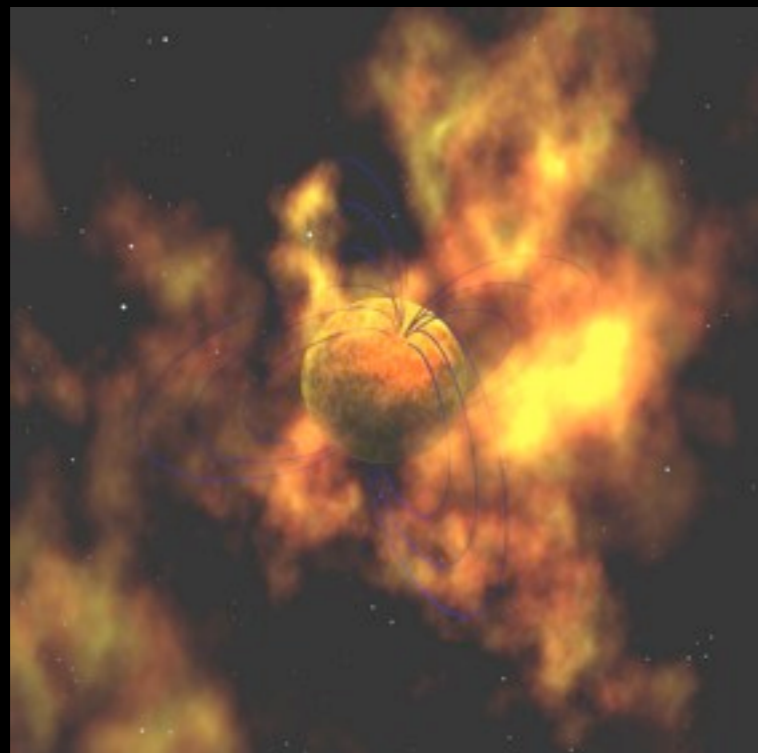
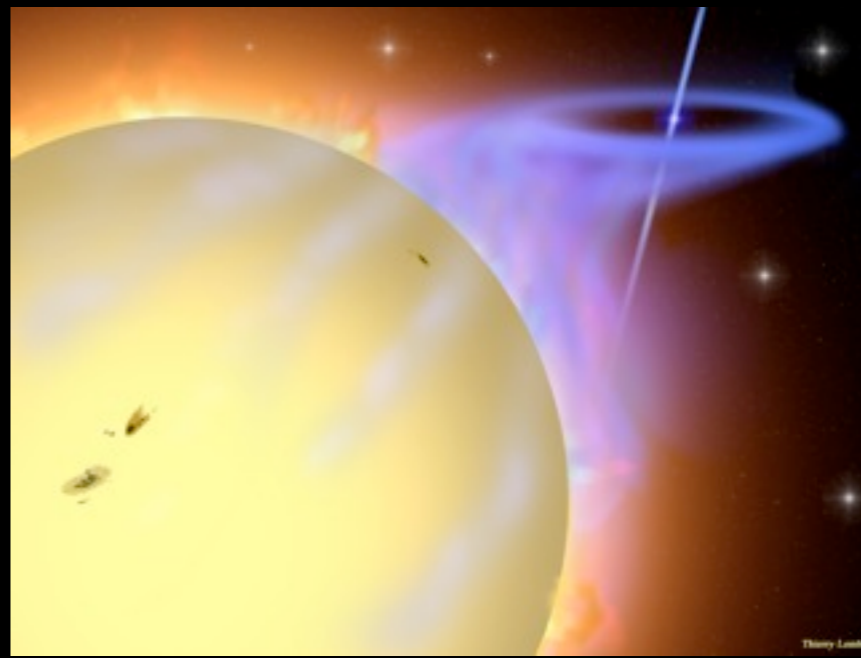
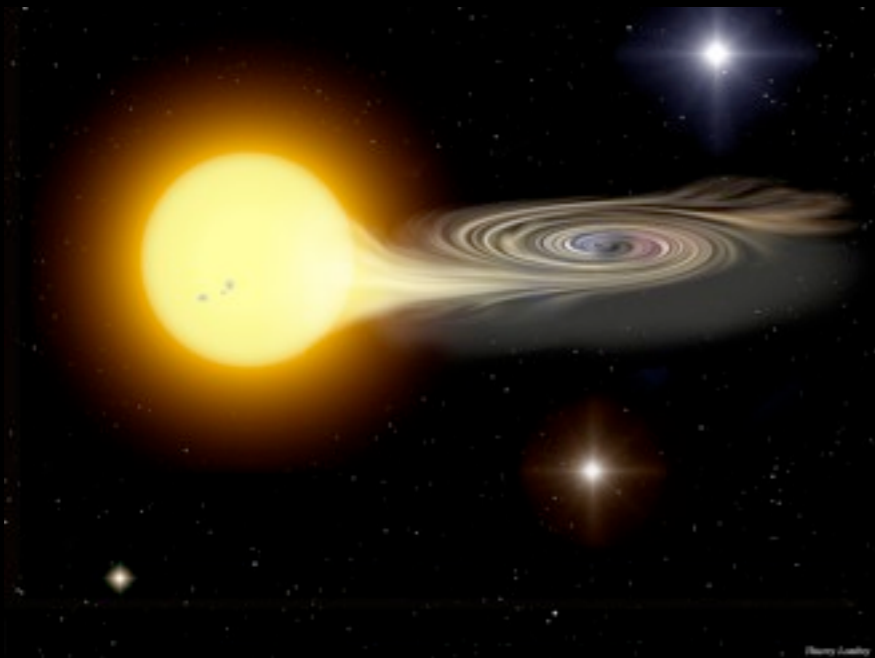


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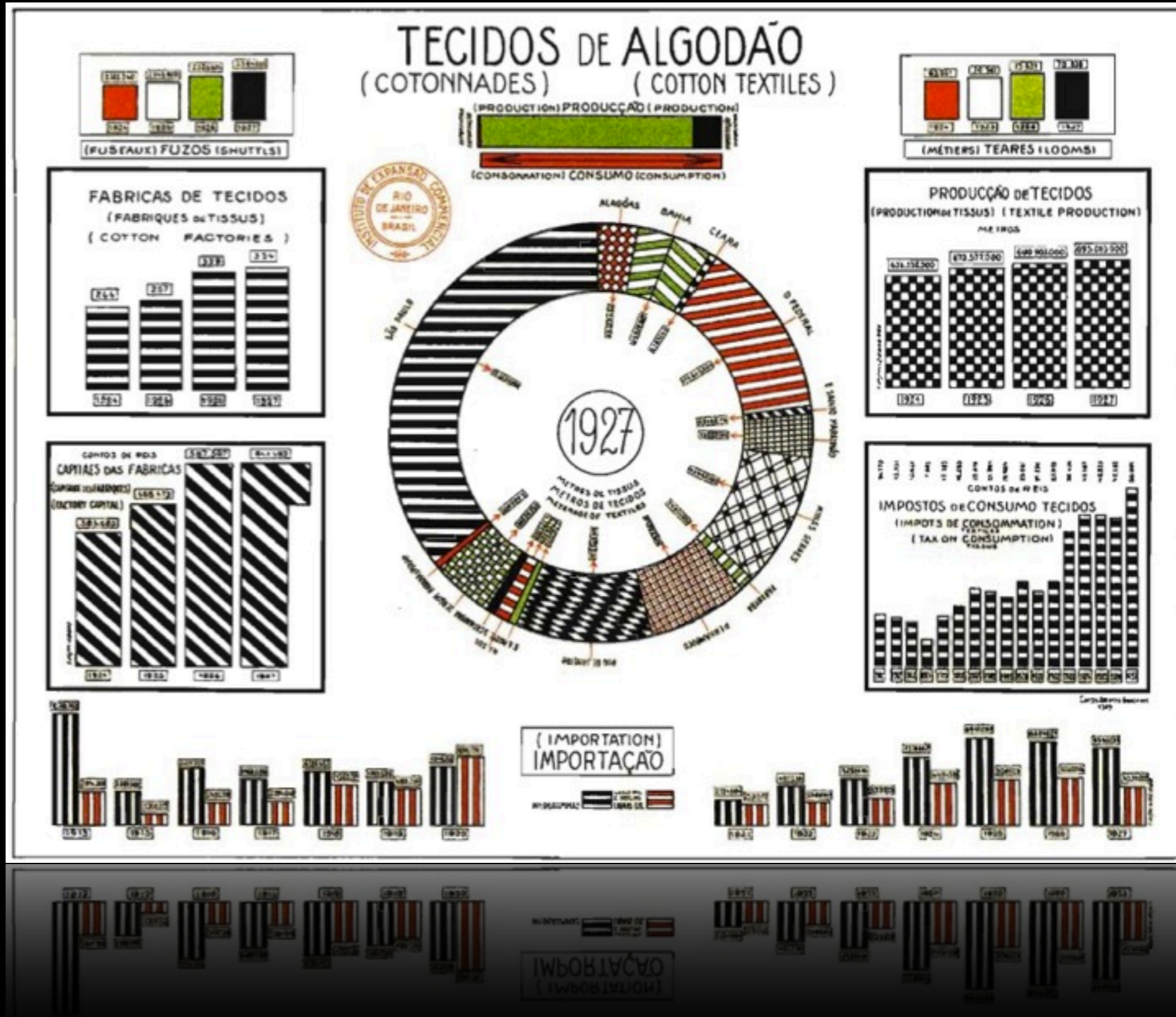




# Very careful



# Careful with the plots

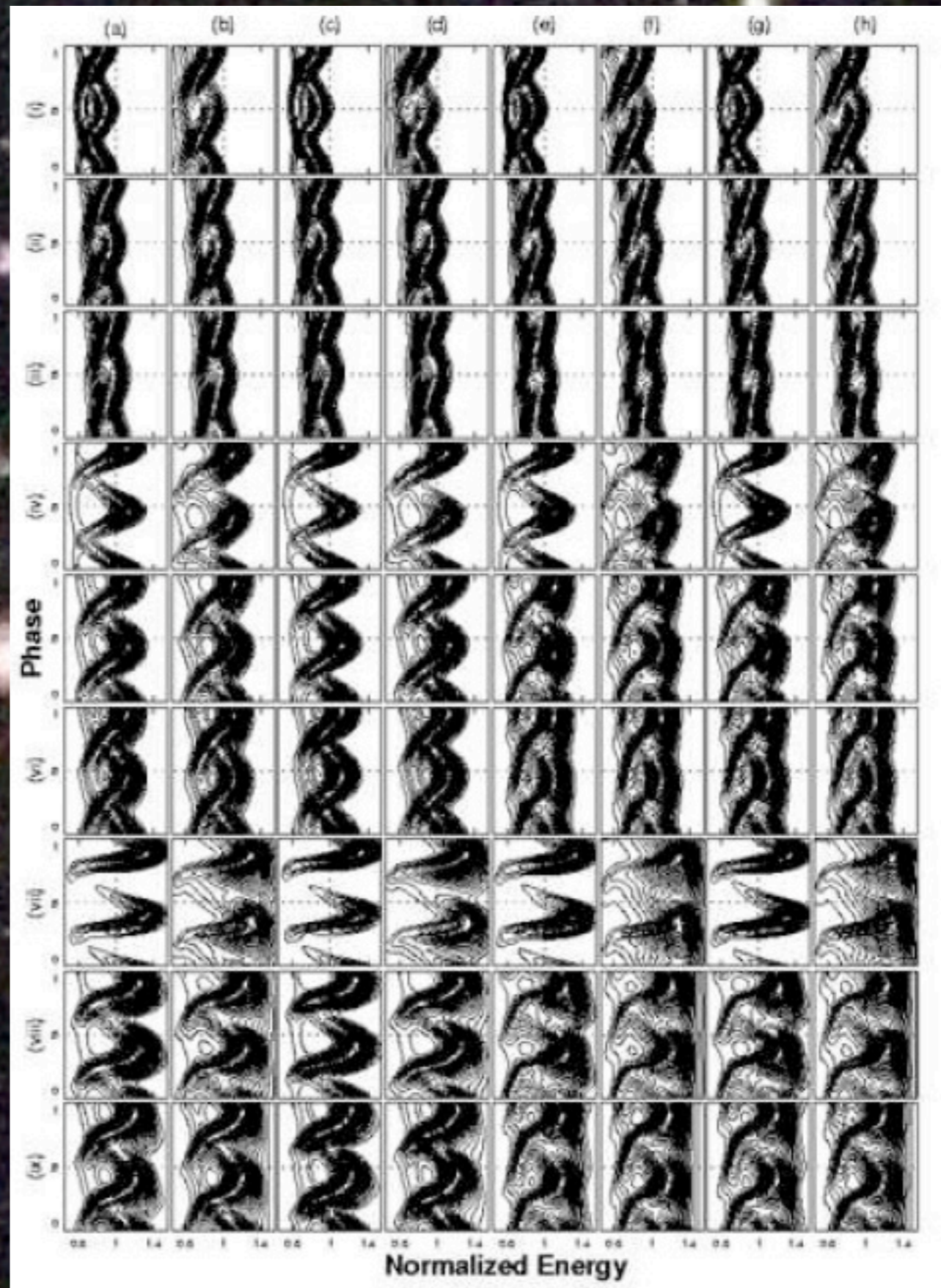


The visual display of quantitative information (E. R. Tufte)



# Crowded slides

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# The slides (II)

- Slide transitions
- Avoid the
- Slide transitions help, but do not overdo it
- Avoid the borders
- Projectors: distorted, overexposed, light
- Top is good, bottom is bad
- I discovered a wonderful proof, but unfortu



# The slides (II)

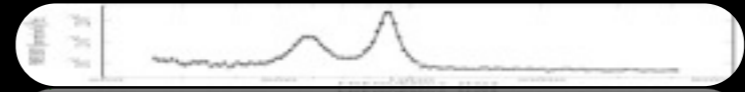
- Slide transitions
- Avoid the “strip tease effect”
- Slide transitions help, but do not overdo it
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# The presentation

- Movement, position, facing
- Triangle, side
- Tone of voice
- Slow (number of slides)
- Use presenter display
- Pointer (DT, weather)
- Keep notes and time (do not trust chair)



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