Z-FLUX

Software to show astronomy-related content in 3D

WHAT IS Z-FLUX?

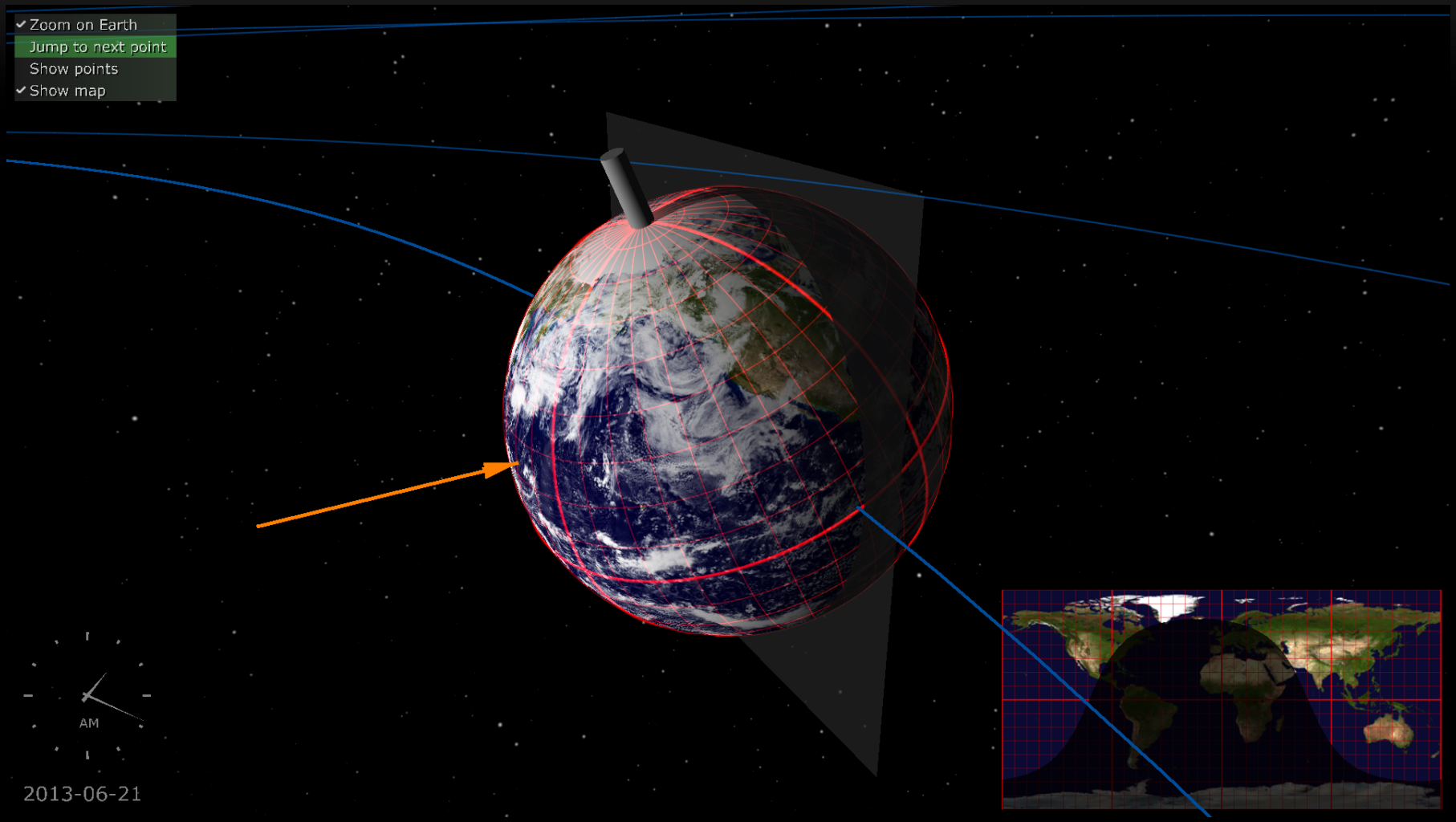
In a nutshell: a freeware software program for real-time, interactive rendering of scriptbased digital animations in stereo.

- Free: can be used free of charge (www.z-flux.com)
- Real-time: all renderings are performed real-time (60 frames per second)
- Interactive: user can control key aspects of an animation (time, position, change parameters,…)
- Stereo: using the appropriate hardware, it can render scenes in 3D by creating side by side stereo-images
- Flexible: script language = FluxScript, can be completely adapted to the desires of the user
- Extensible: an advanced user can develop own animations

THE ORIGIN OF Z-FLUX

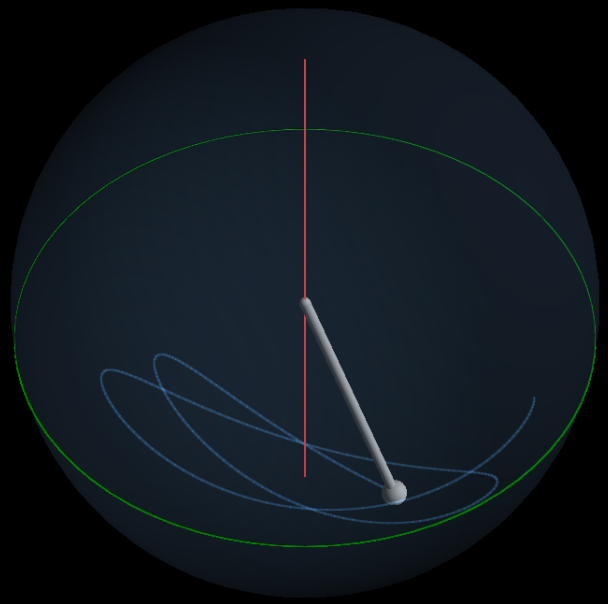
- Public Observatory ‘Armand Pien’, affiliated with the Ghent University
- One of our main goals: make science more popular amongst school children
- Use astronomy as a way to raize interest in physics/sciences
- 3D-projection as an educational tool to bring subjects related to astronomy and space exploration
- Z-flux was developed to visualise this 3D-content.

EXAMPLE: ANIMATION OF THE SEASONS ON EARTH



ADVANTAGE OF Z-FLUX

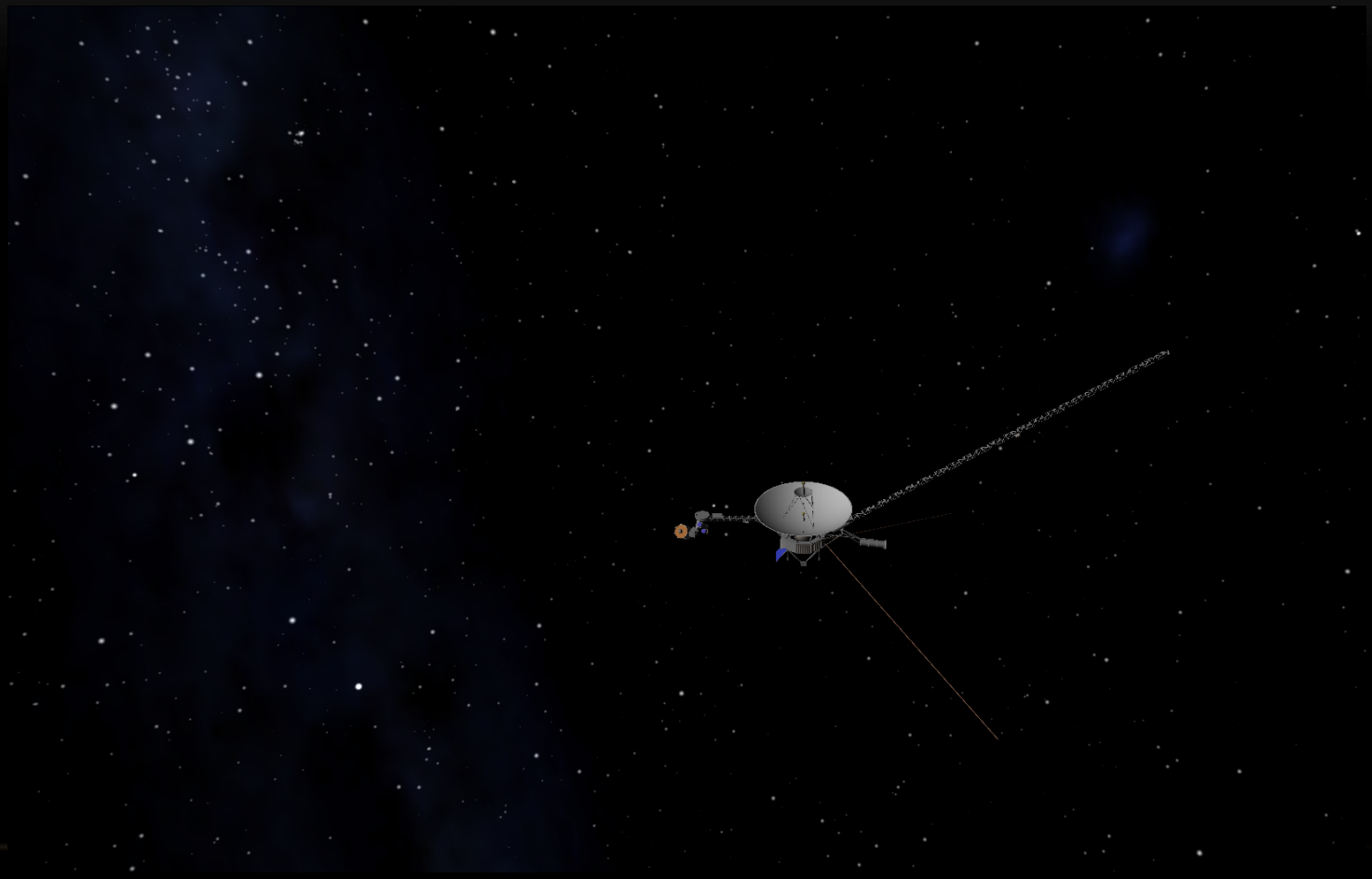
- High level scripting language allows quick development of powerful animations
  - Powerful mathematics engine, knowledge of laws of physics, advanced geometry tools, campera control functions
  - Example: a circular pendulum



ADVANTAGE OF Z-FLUX

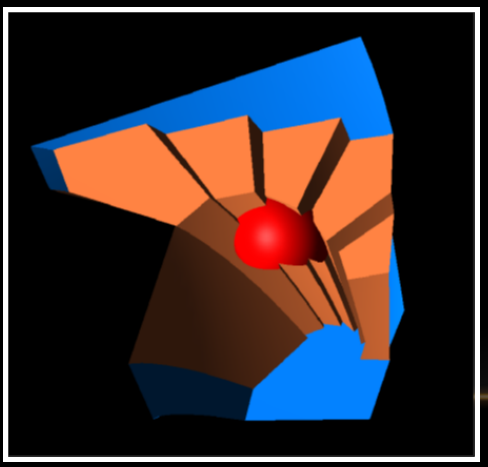
- Reads and displays 3DS files (standard 3D model format)
- Resolution and projection mode independent
- Possibility to make films (with sound effects, fading,…)
- Warped projection possible (for dome projection)

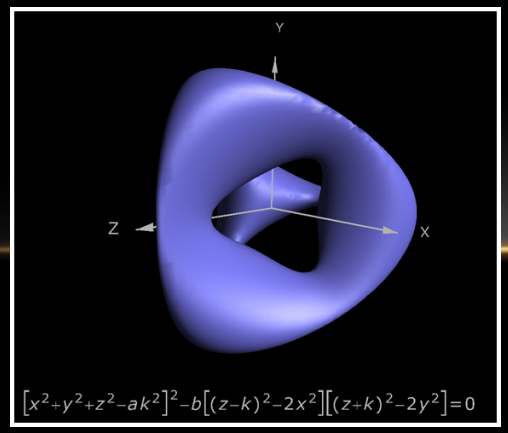
EXAMPLE: VOYAGER MODEL

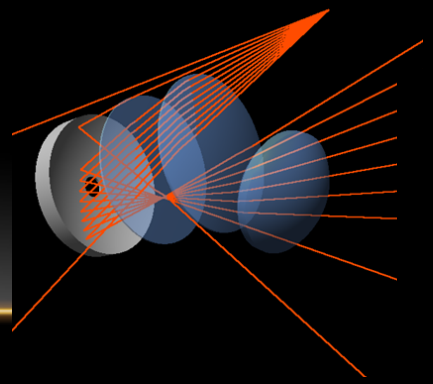


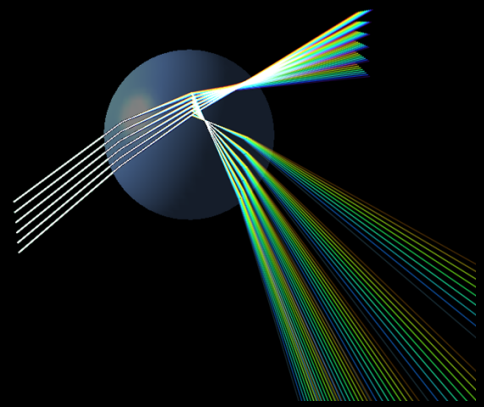
Z-FLUX AS A REAL-TIME STEREO RENDERING ENGIN

- Constructive solid geometry, with boolean operators to combine objects into new ones
- Implicit surface rendering
- Elementary ray tracing and surface reflection/refraction = great for rendering optical systems
- Particle engines





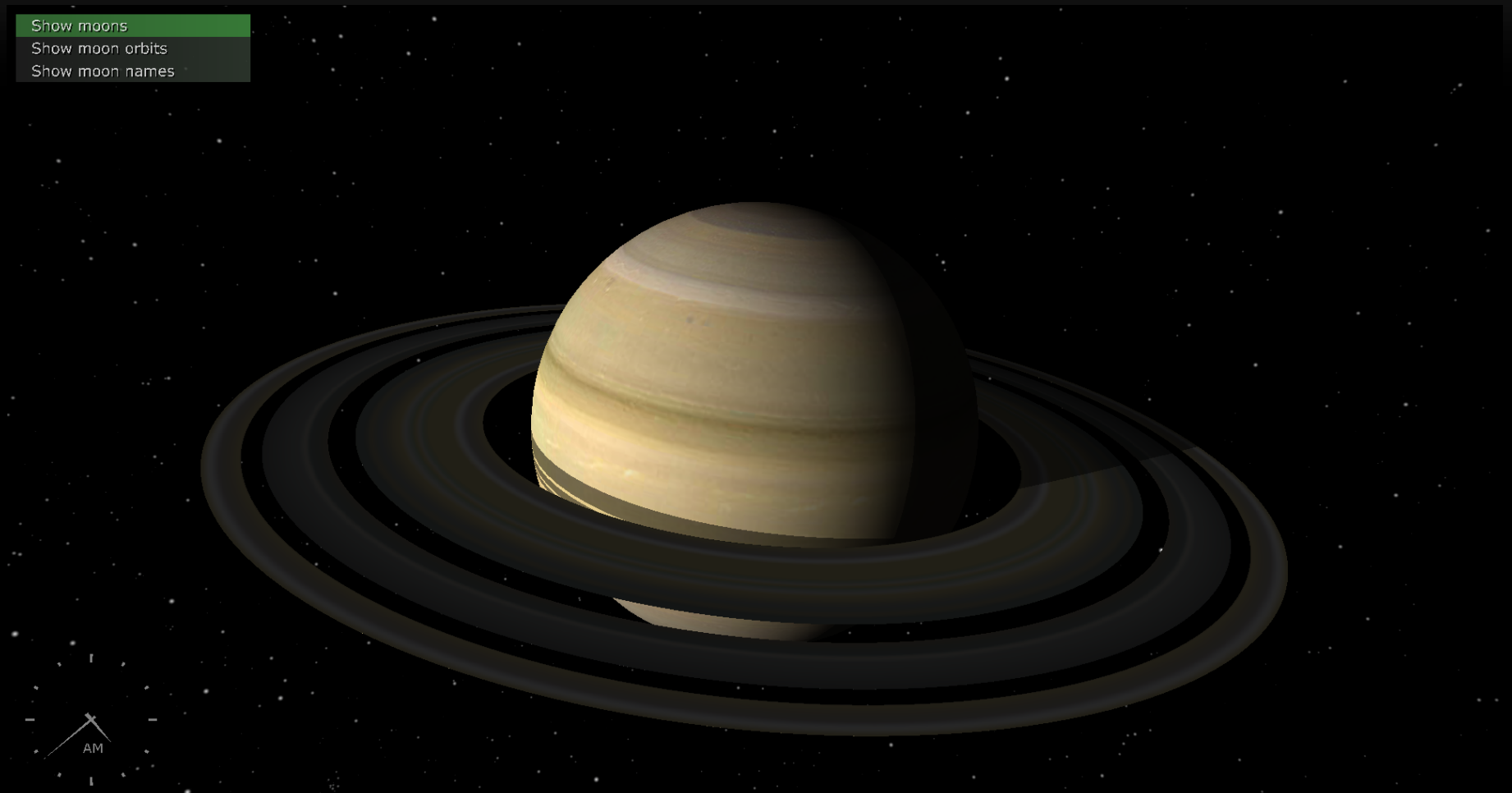




ASTRONOMY COMPONENTS LIBRARY

- Precise rendering of Solar system planets and major moons
- Rendering of thousands of asteroids and comets
- Deep sky back drop
- Variety of control devices
  - Keyboard and mous
  - (wireless) gamepad
  - Space connector (3D pointing device)

EXAMPLE: SATURN AND MOONS



CURRENT EXPERIENCES

- At the Public observatory we use it for:
  - Movies for general public (3000 persons on individual basis)
  - Interactive animations in lessons: audience asks questions and the lecturer shows an animation which he controls with the game pad
  - Mix of movie and interactive animations for school groups: works great
  - New animations are in development

FURTHER IDEAS

- Can offer Z-flux content in an easy-to-use browsable environment

  = ideal for self-exploration by visitors (museum)
- Working on a 3D photo booth with cloud pictures
- And you?