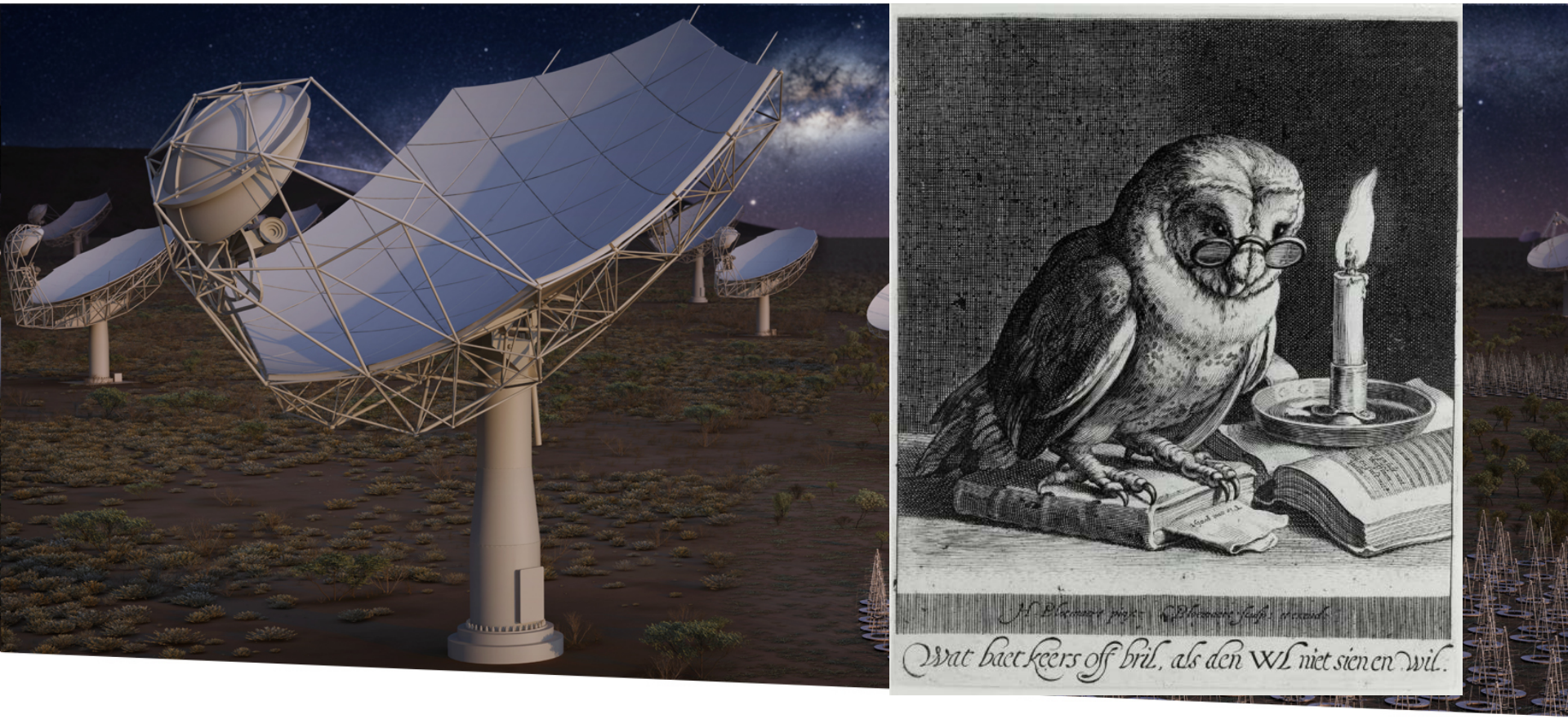
Writing a Proposal

What we want you to do over the next 4 days



SQUARE KILOMETRE ARRAY

Exploring the Universe with the world's largest radio telescope

Robert Laing
ASTRON, Oct 16 2017

What do we want you to do?

- Form small groups (~10 people)
- Pick a science topic
  - (Best) one of your own
  - (Next best) in discussion with tutors
  - (Backup) Selected from the list on the following slides
  - Please be prepared to compromise: we have a fairly small number of tutors and only a minority are omniscient.
- Decide what array to use for your project (LOFAR, JVLA, eMERLIN, MeerKAT, ASKAP, MWA, ALMA, SKA, EVN, ...)
- Decide what configuration, frequency, bandwidth, spectral configuration to use
- Outline the technical justification of an observing proposal
- Give a 1-2 slide summary on the last day

Some possible topics (1)

- Imaging molecular emission and determining the history of star formation in a nearby starburst galaxy.
- A spectral survey of dust precursor molecules in evolved stars.
- Magnetic fields from masers, molecules and dust in evolved stars.
- Deep fields
  - Continuum survey of the Hubble Deep Field (cm and mm wavelengths)
  - A blind survey for redshifted CO emission
- Simultaneous multifrequency observations of a blazar flare (e.g. triggered by Fermi-LAT)
- How are electrons accelerated in radio relics?
- Extra-galactic Supernova remnants – spectral index, polarization?
- Search for methanol masers above 100 GHz
- M87: what is the connection between gamma-ray flares and radio emission

Some possible topics (2)

- Image the shadow of the black hole event horizon in M87
- Determine the dynamical mass of a protogalaxy at z = 9 using the [CII] line
- Measure an accurate distance to a high-mass Galactic star-formation region
- Image gaps in a protoplanetary disk caused by planet formation
- Estimate the magnetic-field strength in the Galactic Centre accretion flow from Faraday rotation
- Image atomic and/or molecular gas in nearby spiral galaxies
- Can we detect HI emission in galaxy clusters at z = 1.5?
- Find and map dead and/or restarted radio galaxies
- An HI survey complete to z = 0.1
- Image the polarized emission from Jupiter's radiation belts
- Find the radio counterpart of a gravitational-wave detection

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