

Exploring With The World's Most Powerful Telescope

National Radio Astronomy Observatory

The Very Large Array (VLA)



Green Bank Interferometer



Starting the VLA

Dirt, Dirt, and More Dirt



Dedication Ceremony: 1980



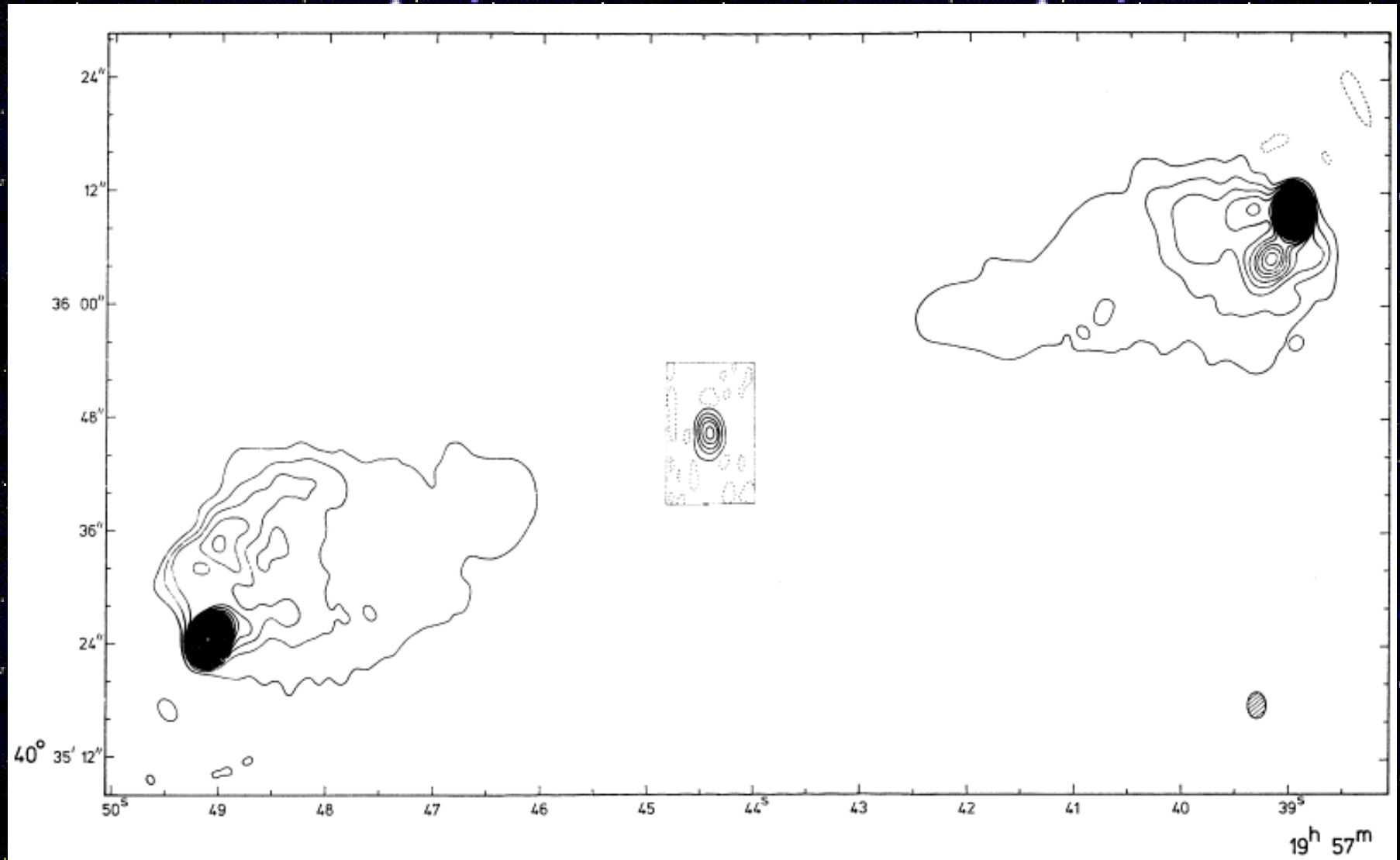
The Long VLA Railroad System



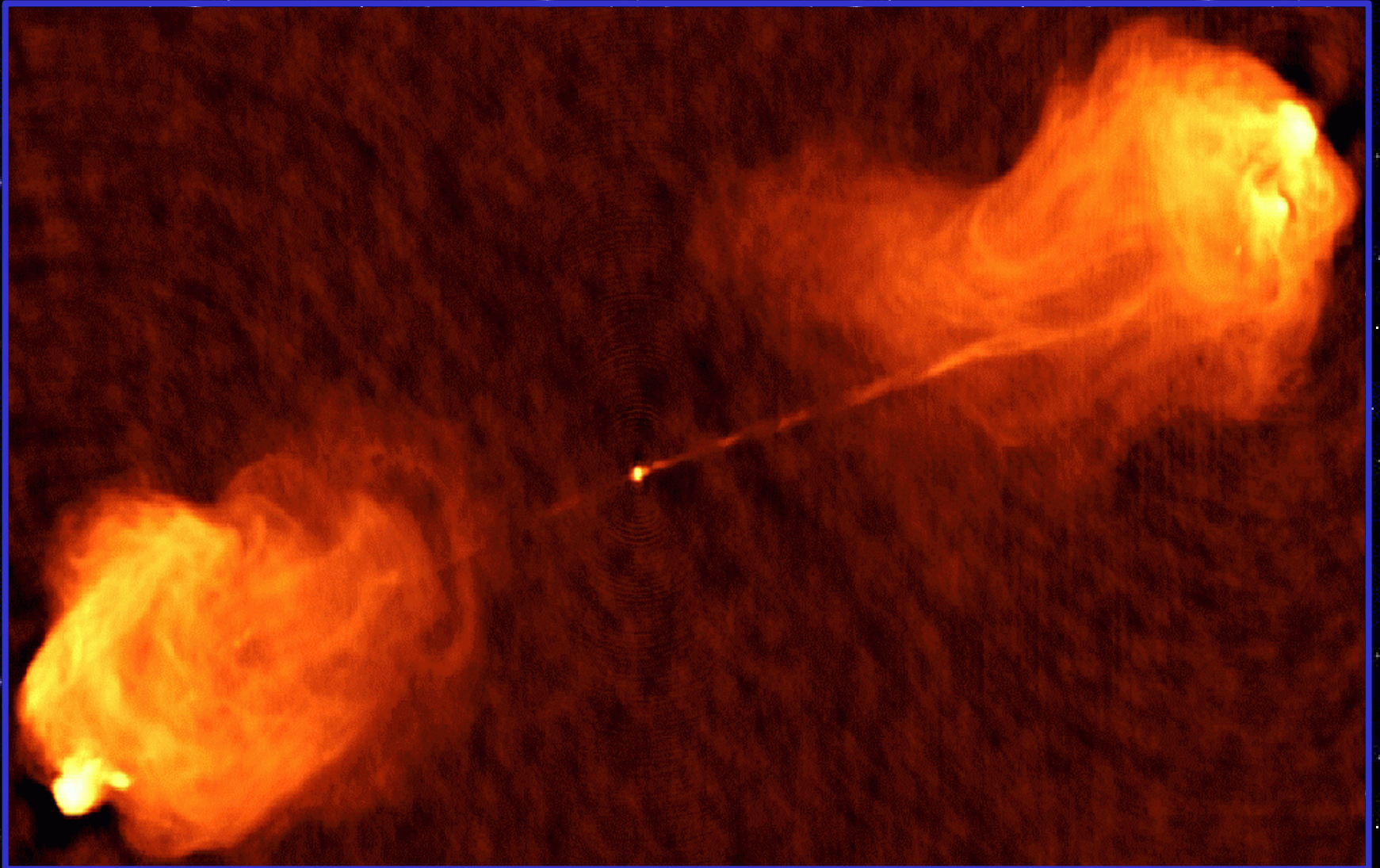
Traffic Jam, VLA Style



Radio Galaxy Cygnus A: Pre-VLA



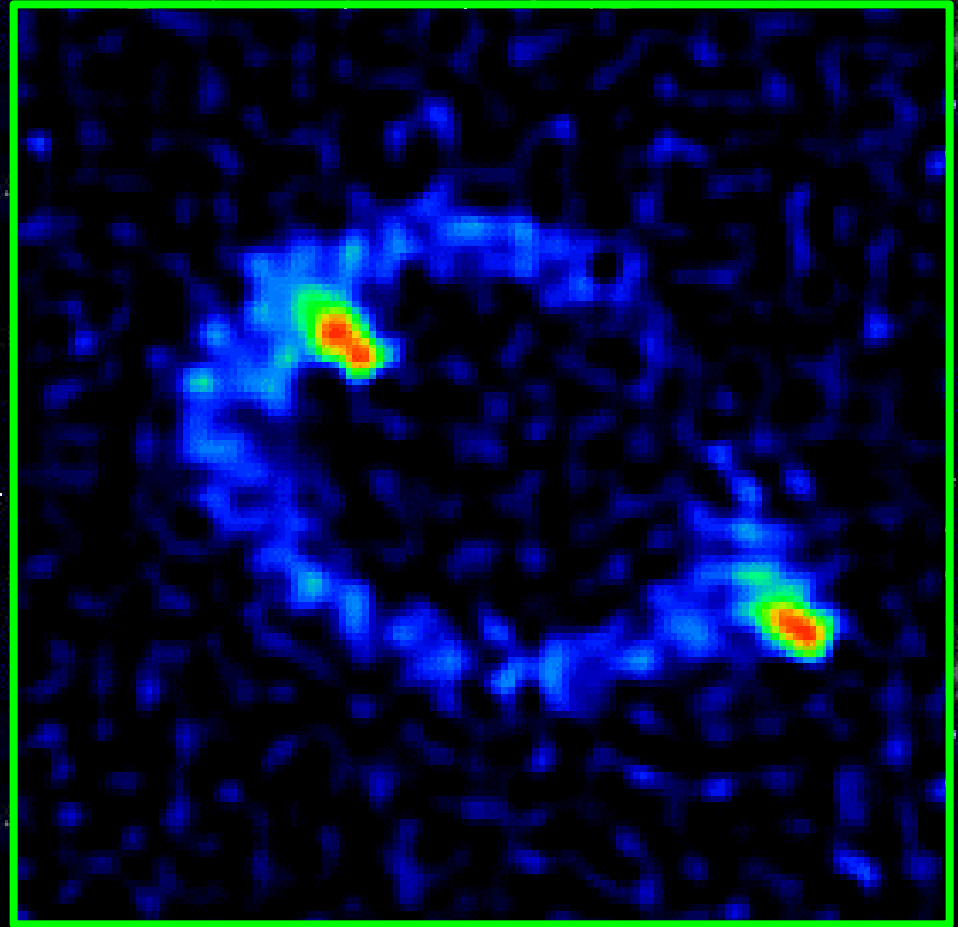
Cygnus A Imaged by the VLA



Gravitational Lenses

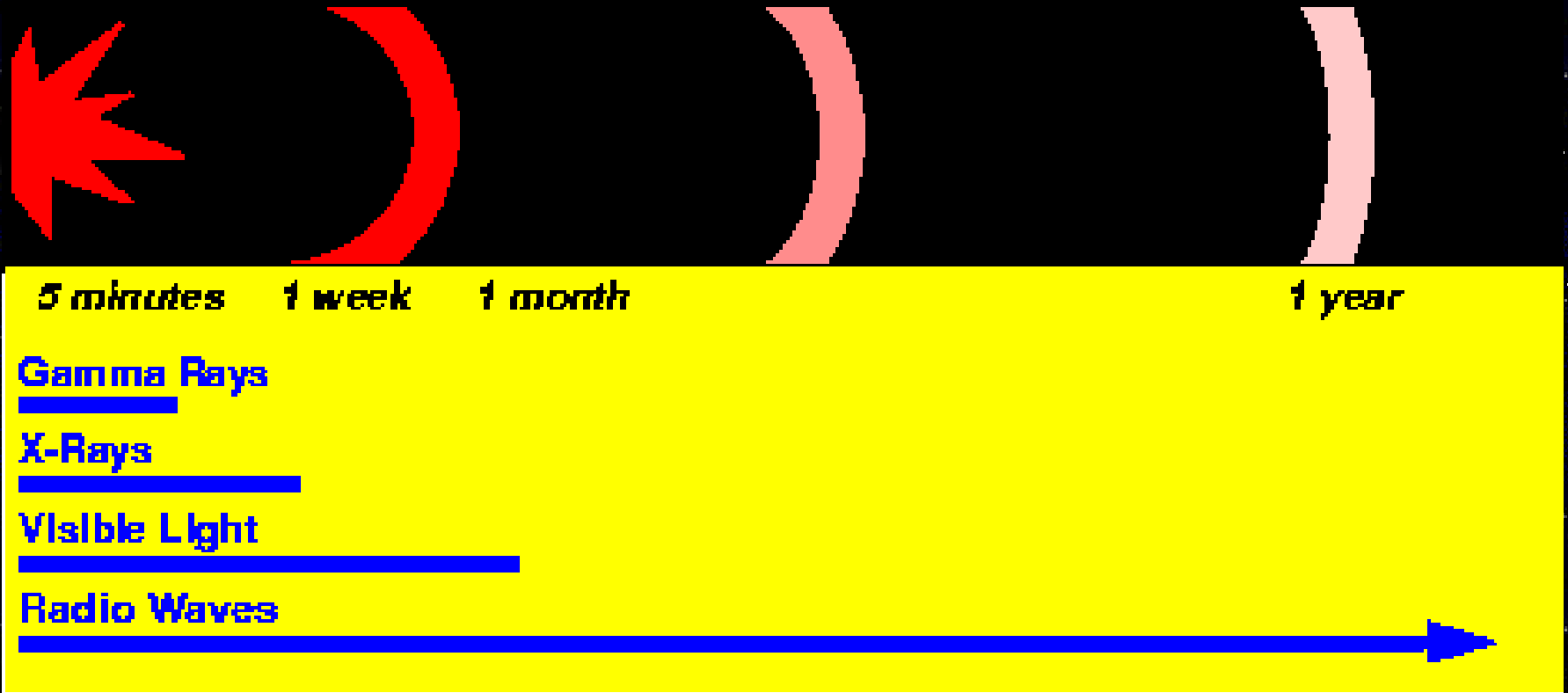
The first Einstein
ring, discovered
by the VLA

An intervening
galaxy “lenses”
a background
quasar into a
ring



Cataclysmic Explosions in Distant Galaxies

Observability of Gamma Ray Burst Fireballs





Wide-Field Radio Image of the Galactic Center

$\lambda = 90 \text{ cm}$

(Kassim, LaRosa, Lazio, & Hyman 1999)

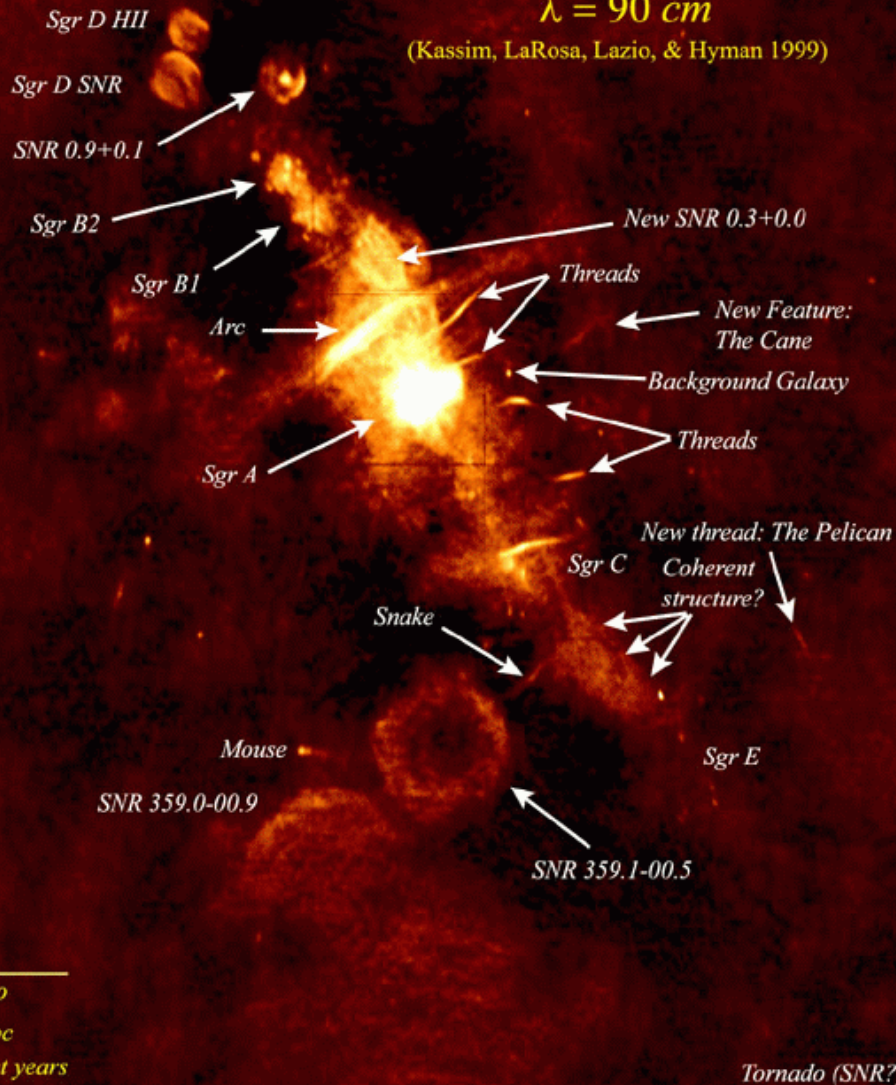
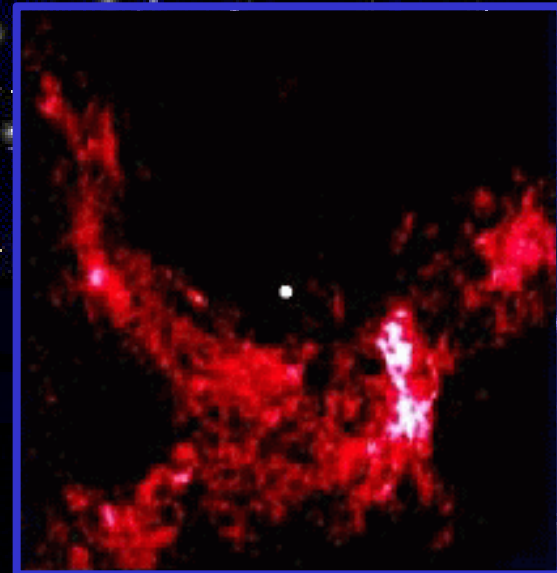
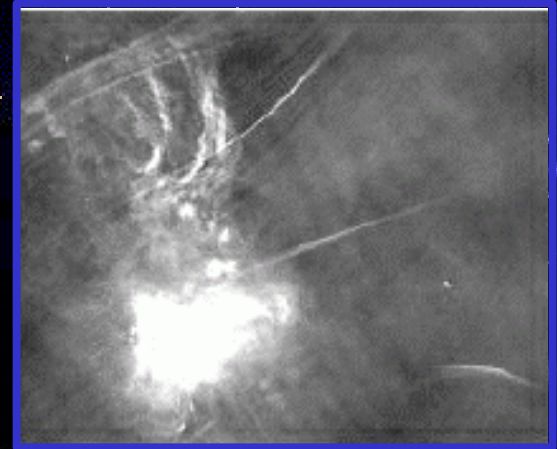


Image processing at the Naval Research Laboratory using DoD High Performance Computing Resources
Produced by N.E. Kassim, D.S. Briggs, T.J.W. Lazio, T.N. LaRosa, J. Imamura, & S.D. Hyman
Original data from the NRAO Very Large Array courtesy of A. Pedlar, K. Anantharamiah, M. Goss, & R. Ekers

Center of our Galaxy

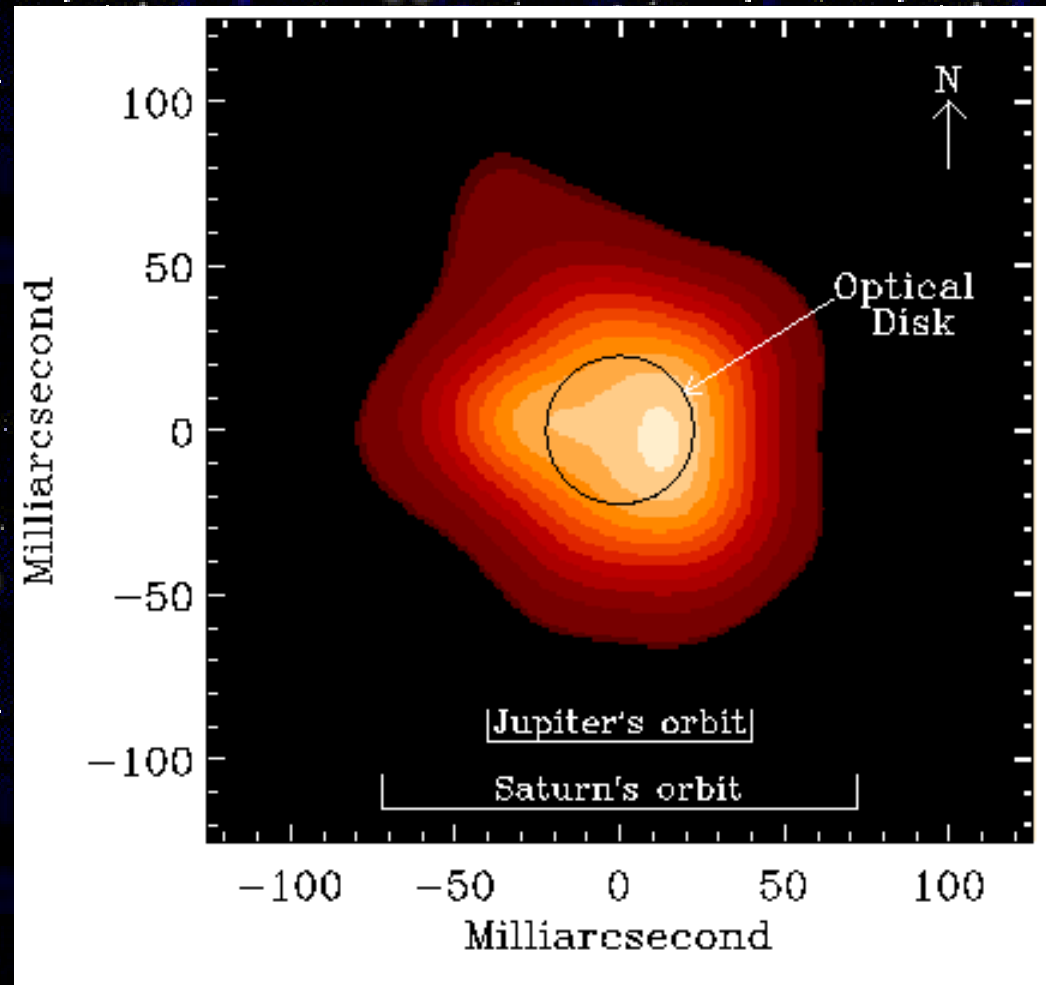


Betelgeuse (α Orionis)

Red supergiant in
Orion

Star contains a very
bright radio-
emitting corona

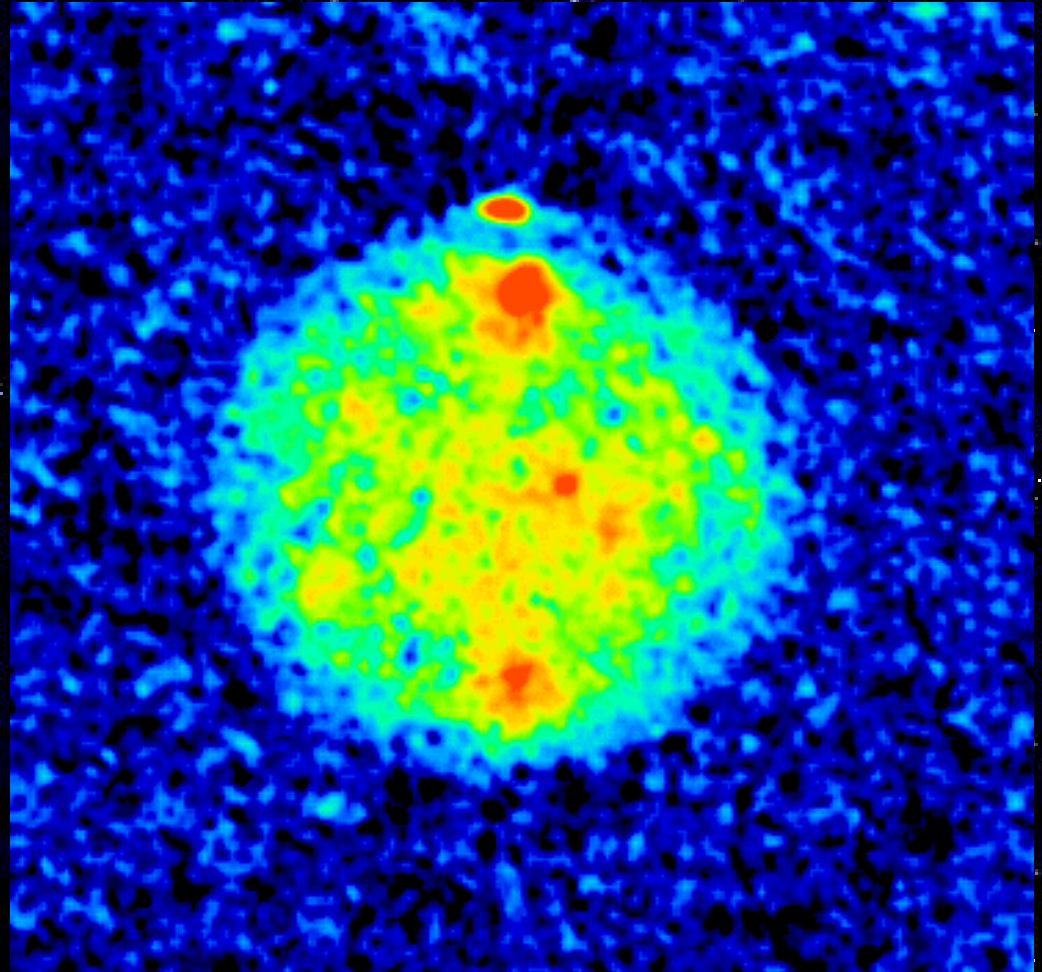
Caused by
convection and
mass loss in star's
atmosphere



Mercury: A Hot Planet with Ice

Radar transmitted by
NASA tracking
station is reflected
and received by
VLA

Red dot at top is
water ice in
shaded crater at
North Pole



VLA is Taxpayer-Supported



Public and School Tours



The Expanded VLA (EVLA)

More than 700 astronomers use the VLA every year ...

However, most of the electronic equipment dates back to the late 1970s

The VLA has produced more published science than any other telescope on the face of the Earth

However, its capabilities have improved only incrementally over the last 20 years

The National Science Board has approved Phase 1 of the Expanded VLA

New electronics, receivers, fiber optics, & central processor

1970s waveguide
to be replaced
by fiber optics
with 100 times
more capacity



EVLA
Phase 2
“New Mexico
Array”
10 times better
resolution (fine
detail) than the
VLA
Not yet funded



VLA: The Adventure Continues

