The Megamaser Cosmology Project

Jim Braatz   Mark Reid
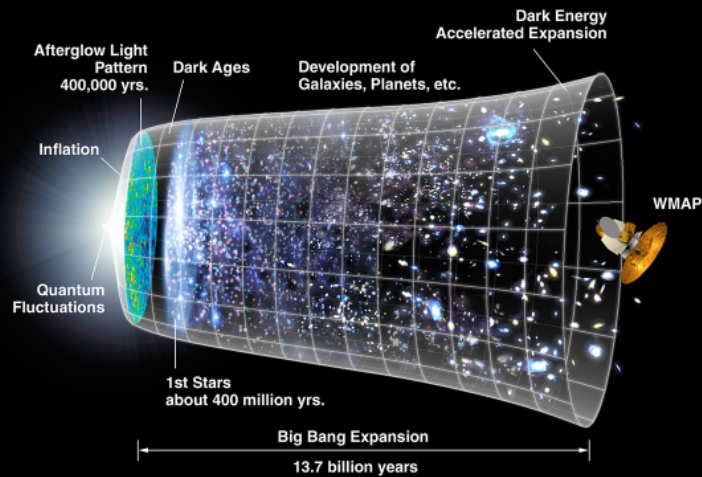Lincoln Greenhill   Christian Henkel
Jim Condon   Fred Lo

Dark Energy and H$_0$

"While models with Ω_{DE}=0 are not disfavored by the WMAP data only, the combination of WMAP data plus measurements of the Hubble constant strongly constrain the geometry and composition of the universe"
Spergel et al. 2006

"The single most important complement to the CMB for measuring the DE equation of state at z ~ 0.5 is a determination of the Hubble constant to better than a few percent."
Hu 2005
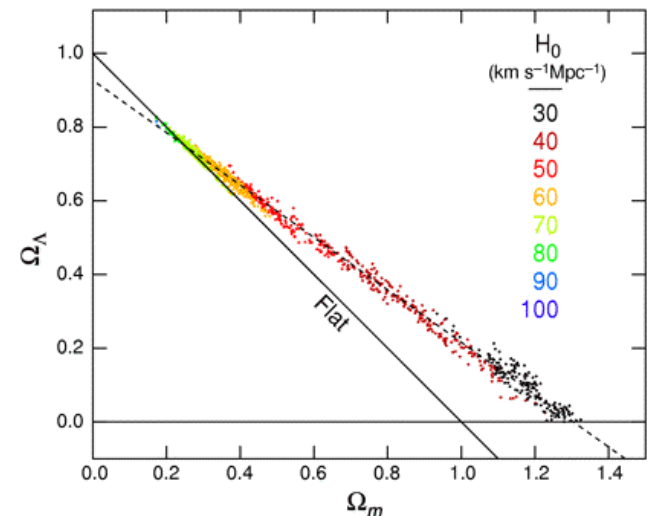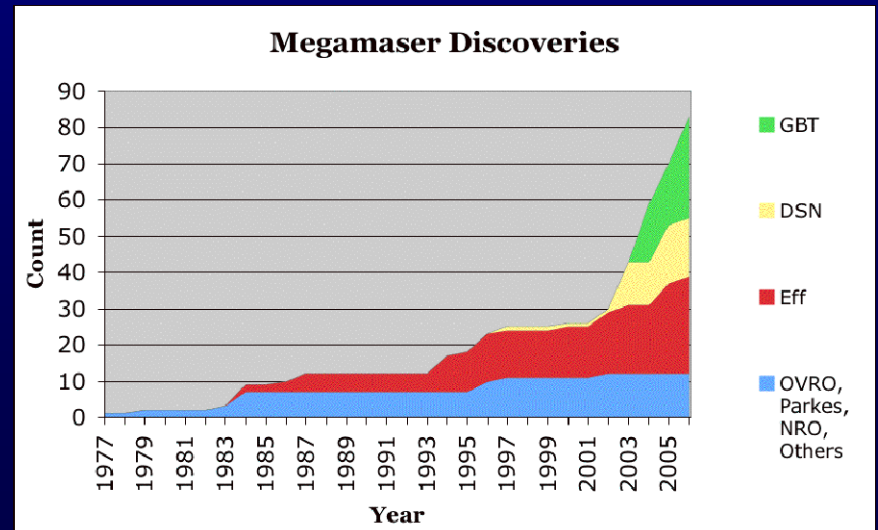
Measuring Distances to H_2O Megamasers
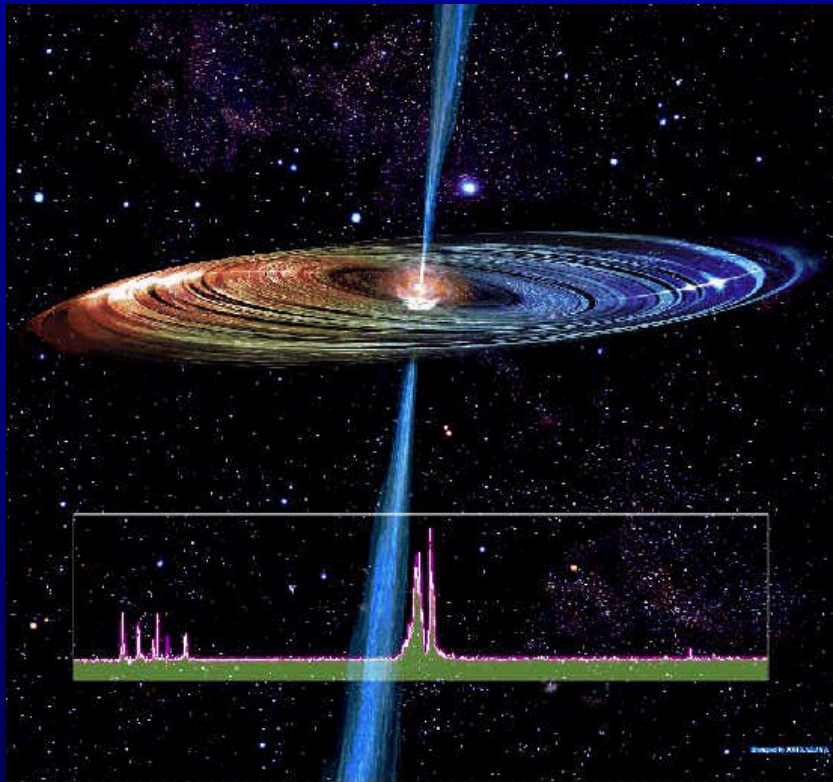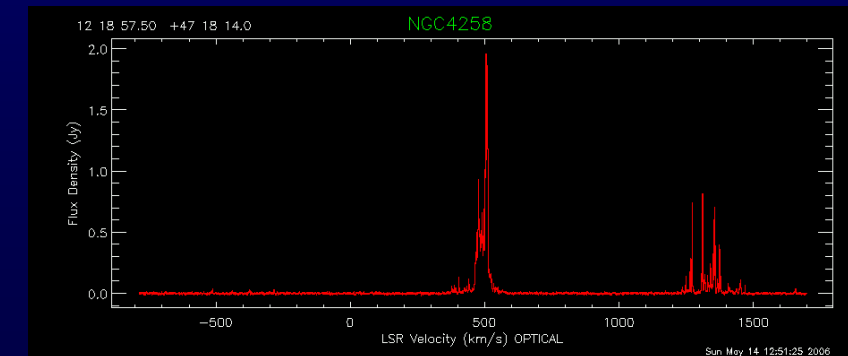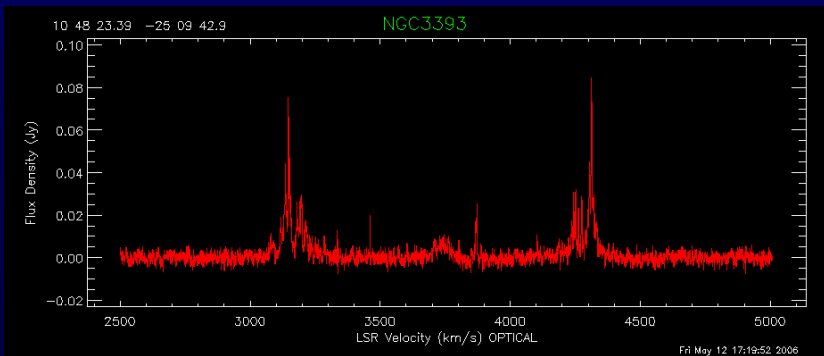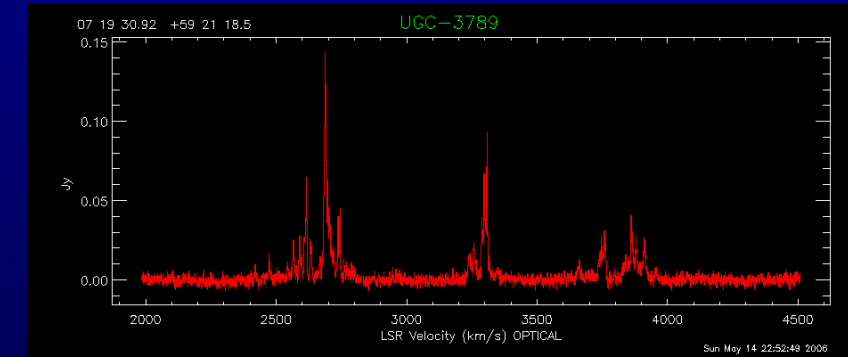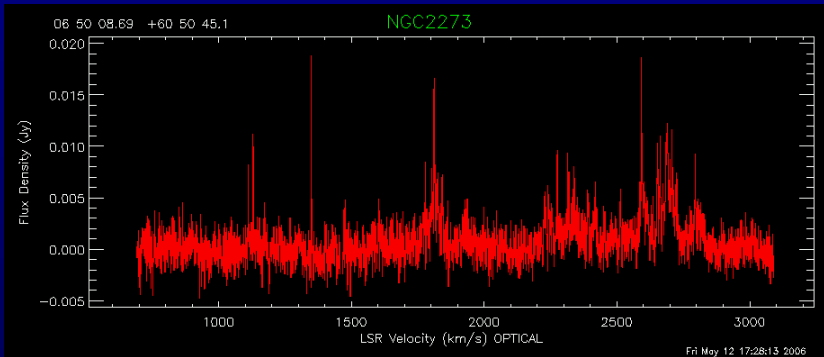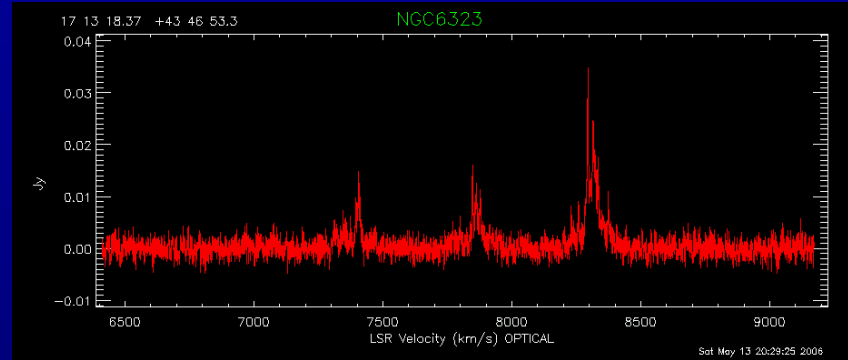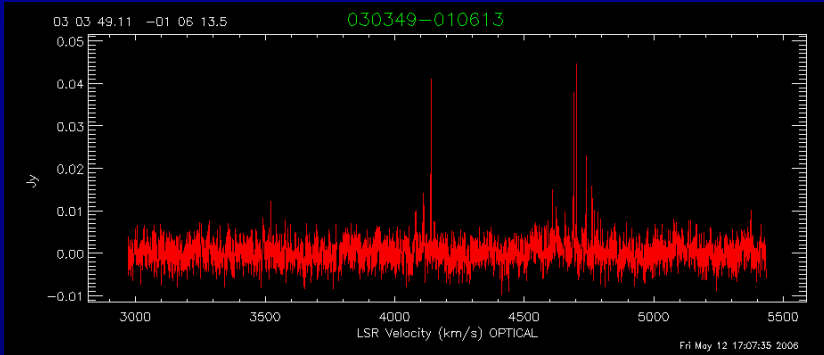

NGC 4258

Requires:
- Detect the best candidates (GBT surveys)
- Measure accelerations (GBT Monitoring)
- Assess VLBI calibrators (VLA snapshots)
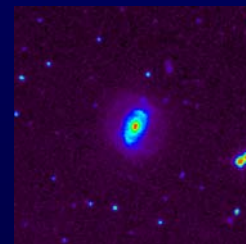- VLBI imaging (VLBA + GBT + Eff)
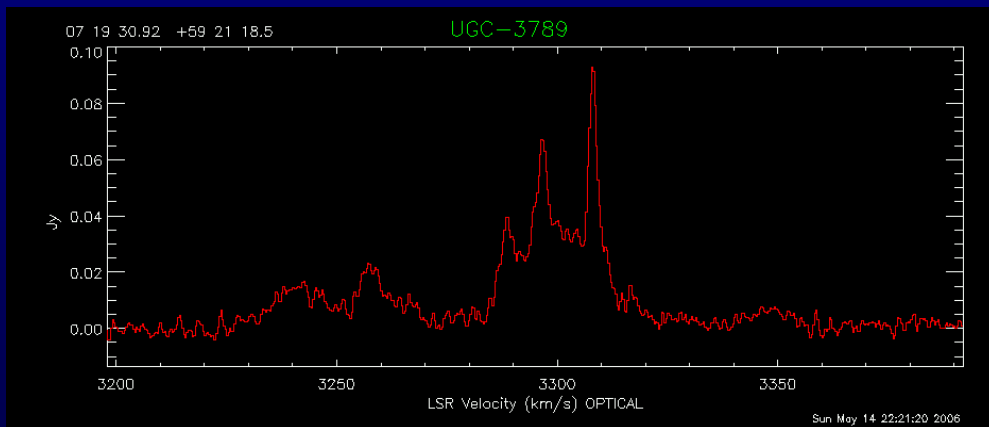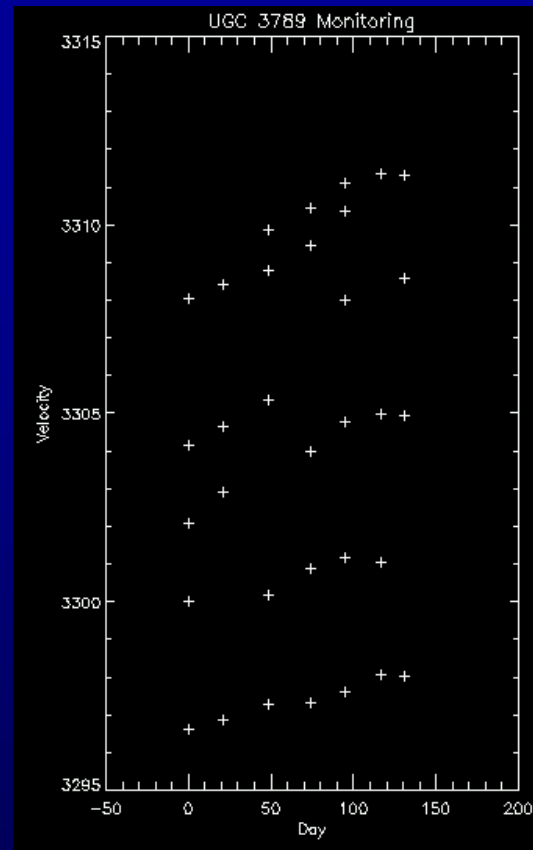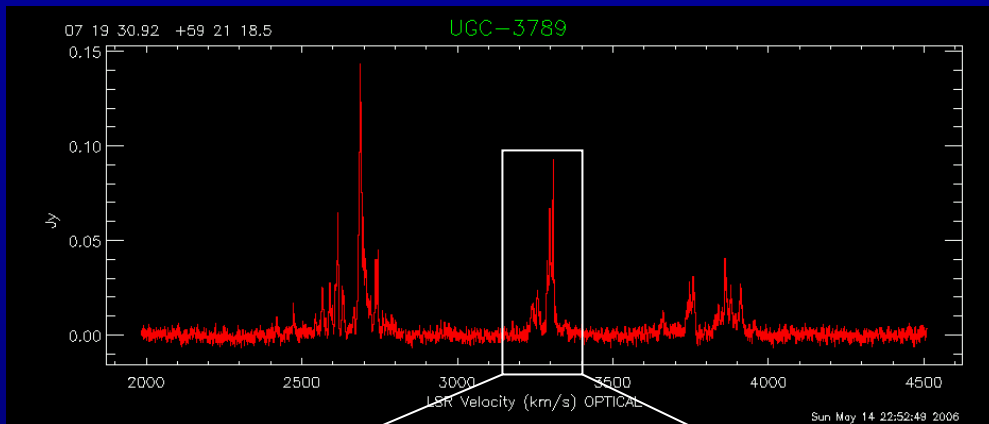- Modeling

Goal:
- 10+ distances to obtain H_0 with better than 3% uncertainty
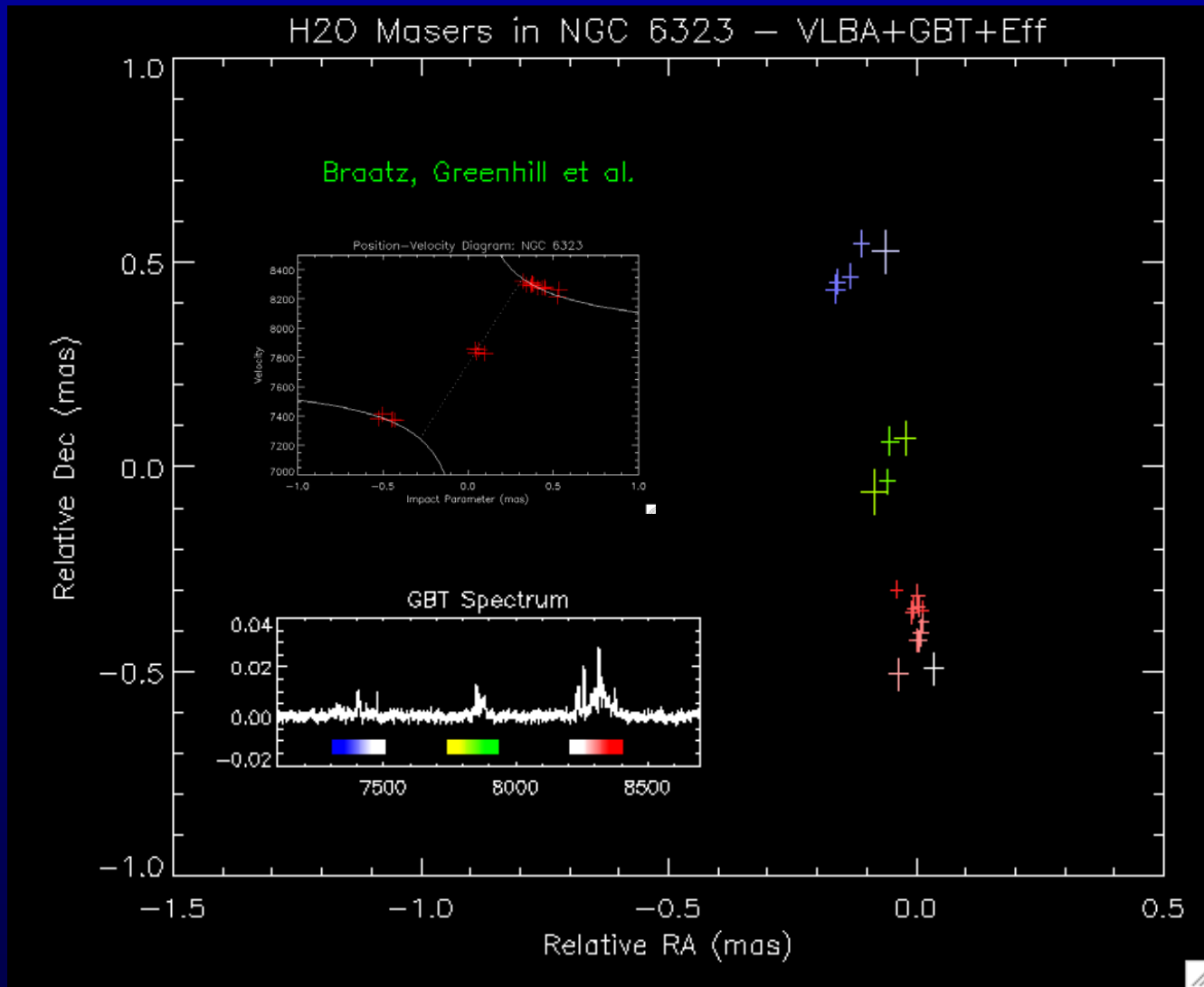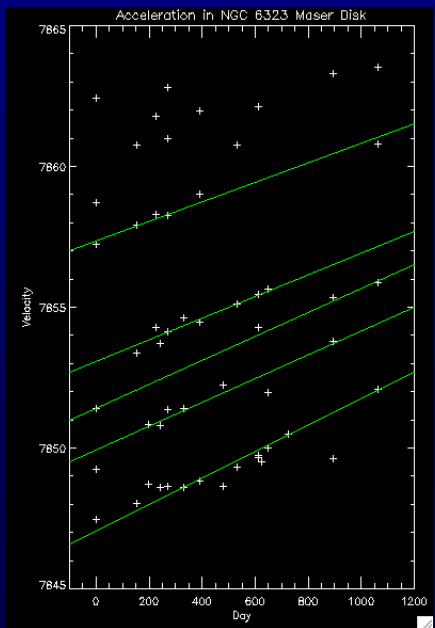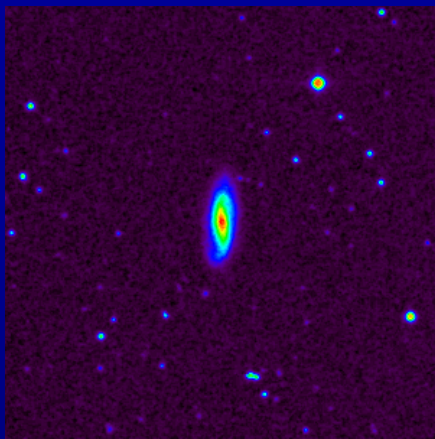
GBT Spectra of Maser Disks

UGC 3789

$M_{BH} \sim 9 \times 10^6\ M_{sun}$

Braatz and Gugliucci, in prep.

NGC 6323

Resources Required for the MCP

- ## Schedulable
  - GBT time for surveys and monitoring (~ 250h per year)
  - VLBA+GBT+Eff time for mapping (~ 100h per year)
  - VLA time for calibrator assessment (~ 15h per year)

- ## Procedural
  - Benefit from improvements in GBT and HSA dynamic scheduling
  - Cross-telescope proposals defined by the science goals

The Megamaser Cosmology Project:

http://www.cfa.harvard.edu/wmcp