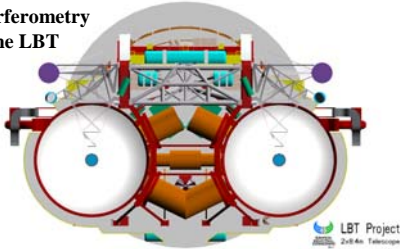


SERPIL: A Near-Infrared Interferometric Integral Field Spectrometer for the LBT

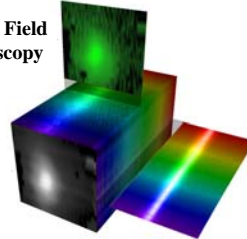
F. Müller Sánchez & F. Eisenhauer

Interferometry on the LBT



Integral Field Spectroscopy

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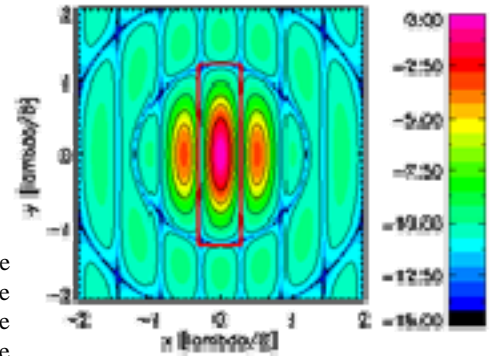


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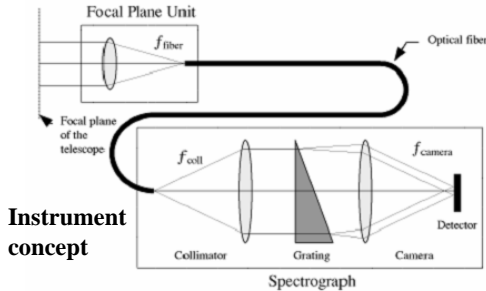
SERPIL:

Spectrograph for Enhanced Resolution Performing Imaging Interferometry on the LBT

SERPIL is a design study for a near-infrared integral field spectrograph for interferometric diffraction-limited observations at the LBT. This instrument offers the exceptional possibility of diffraction limited imaging spectroscopy at a 28 meter-class telescope, when the light of the two primary mirrors of the LBT is combined coherently in the Fizeau interferometric mode. SERPIL will expand the possibilities of the LINC camera adding a spectrographic mode, providing high resolution infrared spectra of more than 1000 image pixels of a two dimensional field.



Interferometric PSF of the LBT



Instrument concept

There are several exciting science drivers for SERPIL. However, we identify nearby AGN as possibly the most interesting targets to observe with this instrument, as we could resolve central star clusters and molecular tori in the nearest objects. This instrument could add valuable information to the AGN paradigm following previous studies as the one presented below with SINFONI.

SINFONI observations of Nearby AGN

F. Müller Sánchez, R. Davies, R. Genzel, L. Tacconi, E. Hicks & S. Friedrich

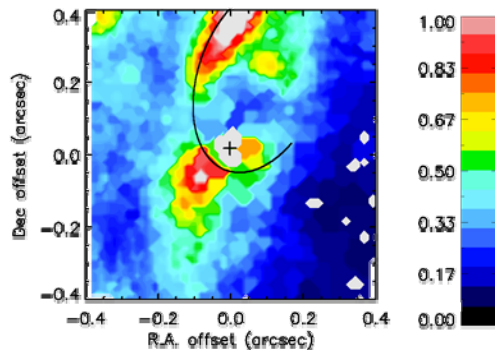
Using adaptive optics on the VLT to reach scales down to 0.075'' in the H- and K- bands, we can for the first time directly resolve the nuclear region of AGN and investigate:

- Star formation activity
- The properties of the molecular gas and its relation to the torus
- Black Hole mass from stellar dynamics
- The forbidden high-ionization lines

Object	Classification	D (Mpc)	Resolution
NGC 1097	LINER, Sy1	18	0.245'' 21pc
NGC 2992	Sy1	33	0.30'' 48pc
NGC 3227	Sy1	17	0.085'' 7pc
NGC 3783	Sy1	42	0.18'' 37pc
NGC 7469	Sy1	66	0.085'' 27pc
NGC 1068	Sy2	14	0.085'' 6pc
Circinus	Sy2	4	0.22'' 4pc
Mkn 231	ULIRG, Sy1, QSO	170	0.176'' 145pc
IRAS 05189-2524	ULIRG, Sy1	170	0.12'' 100pc

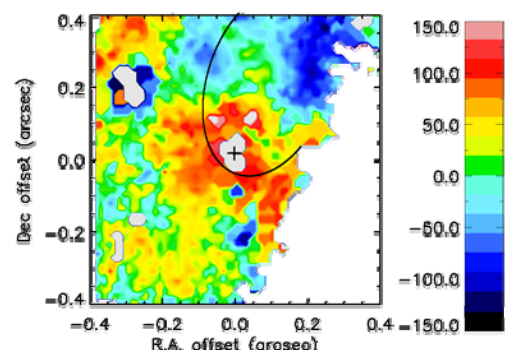
Carrying fuel into the nucleus - gas streamer in NGC1068

Consisting of molecular hydrogen from a ring of gas at ~0.7'' from the nucleus, the streamer feeds gas toward a dusty, possibly rotating, gaseous shell about 5 to 10 pc from the nucleus. The streamer's flow speeds up, from 40 to 90 kilometers per second, as the gas gets closer to the shell. The timescale of this flow is ~2 Myr.



Morphology of the H2 1-0S(1) emission

Nearby AGN Sample



Velocity map of the H2 1-0S(1) emission