

**PROPOSAL COVERSHEET**

DEADLINES: 1st of Feb., June, Oct.

rcvd:

- (1) Date Prepared: June 14, 2007
- (2) Title of Proposal: **Probing for the Intermediate Mass Black Hole IRS13E in the GC stellar cluster**

(3) AUTHORS (Add * for new location)	INSTITUTION	E-mail	Students Only		
			G/U	For Thesis?	Ph.D. Year
A. Eckart	University of Cologne	eckart@ph1.uni-koeln.de			
T.P. Krichbaum	MPIfR, Bonn	tkrichbaum@mpifr-bonn.mpg.de			
R. Schödel	University of Cologne	rainer@ph1.uni-koeln.de			
M. Bremer, K. Schuster	IRAM, Grenoble	bremer@iram.fr, schuster@iram.fr			
L. Meyer, C. Straubmeier	University of Cologne	meyer@ph1..., cstraubm@ph1...			
A. Witzel, J.A. Zensus	MPIfR, Bonn	awitzel@mpifr..., azensus@mpifr...			
M. Morris, J. Mauerhan	UCLA	morris@..., mauerhanastro.ucla.edu			

(4) Related previous or current VLBI proposal(s):  Resubmission

(5) Contact author for scheduling: Andreas Eckart (6) Telephone: +49-221-470-3546  
 Address: I. Physikalisches Institut Fax: +49-221-470-5162  
 Universität zu Köln  
 Zùlpicher Straße 77  
 50937 Köln, Germany

(7) Scientific Category:  astrometry & geodesy  galactic  extragalactic  other:  
 Rapid Response Science:  Known Transient  Exploratory  Target of Opportunity

(8) Wavelength(s) requested (those not available on the global network are indicated with a small circle):  
 90cm  50cm  30cm  21cm  18cm  13cm  6cm  5cm  3.6cm  3.6/13cm  
 2cm  1.3cm  7mm  3mm  
 Global Network standard bands  Special frequencies: centered on SiO: 43122.080/86243.442 MHz

(9) Recording format:  Default continuum setup (VLBA only),  VLBA/MkIV,  MkIII: Mode \_\_\_\_\_  
 Bandwidth per BaseBand channel: 16 MHz  
 Aggregate bit rate: 512 ( 8 BB channels at 32 MSamples/sec of  1 bit,  2 bit )

(10)  Multi-epoch observation: 10 epochs of 9 hours each, separated by 1 day \_\_\_\_\_

(11) Network	Requested antennas	Total time requested
EVN & MERLIN		
VLBA	ALL	up to 10×9 hr (22,43,86 GHz)
other NRAO		
Non-VLBI Instruments	ATCA, CARMA, IRAM, VLT	

(12) ABSTRACT (Do not write outside this space. Please type)  
 We propose to re-correlate the best data set of the BE050H data set in order to probe for compact emission of the possible Intermediate Mass Black Hole at the position of IRS13E at 22, 43 and 86 GHz using the VLBA. IRS13E is the location of the putative intermediate massive black hole (IMBH) at the Galactic Center. It is a mm-continuum source. If a re-correlation of the data would result in the detection of a source this could be interpreted as an essential indication for the presence of such an IMBH at that position. Maillard et al. (2004) suggested that the IRS 13E complex is the remnant core of a massive star cluster that had fallen into GC and is stabilized by an intermediate-mass black hole (IMBH) See discussion by Schoedel, Eckart et al. 2005 (ApJ 625, 111). VLA measurements by Zhao et al. (ApJ 499, L163 , 1998) have shown that there is appreciable mm-emission associated with IRS13E. The offset from SgrA\* are given by Zhao et al. (ApJ 499, L163 , 1998) as -3177 mas in R.A. and -1559 mas in Dec.. A VLBA detection of compact emission could prove the existence of an accreting IMBH at that position.

Scheduler use only  
 (8/03)

- (13) Observation type:  Interferometry,  Spectroscopy,  Pulsar,  Phase referencing
- (14) Proposal is  Suitable  Unsuitable for dynamic scheduling.
- (15) Polarization:  Single Polarization  Dual Circular Polarization  
Global network standard for single polarization is LCP for all  $\lambda$ s except 13cm (RCP) and 3.6cm (RCP).
- (16) Tape usage (Show <recording time>/<total time>): 13.8/17 min= 0.81
- (17) Assistance required:  
Observation Setup:  Consultation,  Extensive help,  Observe file preparation  
Postprocessing:  Consultation,  Extensive help,  Calibration service
- (18) Processor:  Socorro,  JIVE,  Haystack,  Bonn,  Washington,  Other \_\_\_\_\_  
Special processing:  XPol,  Pulsar gate,  Multiple Fields: \_\_\_\_\_  
Averaging time: 1 sec Spectral channels per baseband channel: 512 for SiO lines at 7mm/3mm  
 Other special processing: spectral lines at 7/3mm correlated separately
- (19) Postprocessing Location: Cologne and Bonn
- (20) Source list:  J2000  B1950  
If more than 4 sources, please attach list. If more than 30, give only selection criteria and GST range(s)

	Source 1	Source 2	Source 3	Source 4
Name(s)	Sgr A*	VXSgr	NRAO530	1921-293
RA (hh mm)	17h45m39.8533s	18h08m04.049700s	17h33m02.705785s	19h24m51.055957s
Dec (dd.d)	-29d00'29.6630"	-22d13'28.05190"	-13d04'49.54823"	-29d14'30.12112"
GST range (Europe)				
GST range (US)	21h30-04h30	21h30-04h30	20h30-05h00	23h30-05h30
GST range (Other)				
Band(s)	22/43/86 GHz	43/86 GHz	22/43/86 GHz	22/43/86 GHz
Flux density (Total, Jy)	2-3 Jy at 3mm	~ 90 Jy at 7mm	2-4 Jy at 3mm	5-10 Jy at 3mm
Flux density (correlated, mJy)	0.3-1.5 Jy at 3mm	~ 10-20 Jy at 7mm	1-2 Jy at 3mm	5 Jy at 3mm
RMS needed (mJy/beam)	2-4		5	5
Peak/RMS needed	> 200 : 1 at 3mm		> 50 : 1	> 50 : 1

- (21) Preferred VLBI session or range of dates for scheduling, and why:  
as many epochs as possible during global campaign (May 14 - 24, 2007)
- (22) Dates which are NOT acceptable, and why:
- (23) Attach a self-contained scientific justification, not in excess of 1000 words.  
Preprints or reprints will not be forwarded to the referees.

Information about the capabilities of the VLBA may be found on the World Wide Web by starting at the NRAO home page, <http://www.nrao.edu>, and selecting the VLBA from "Sites and Telescopes."

A brief summary of the capabilities of the EVN antennas is given in the EVN STATUS TABLE in the EVN USER GUIDE, which may be found at [http://www.evlbi.org/user\\_guide/user\\_guide.html](http://www.evlbi.org/user_guide/user_guide.html).

Please include the full postal addresses for first-time users or for those that have moved (if not contact author).