

Curriculum Vitae

Surname: Golap

Other name: Kumar

Date of Birth: 08 September 1966

Nationality: Mauritian

Marital Status: Single

Present address:

714 Liles Street,
Socorro,
NM, 87801

Workplace address:

P.O Box O,
NRAO,
Socorro,
NM, 87801.

Work Phone: (1) (575) 8357389 **Work Fax:** (1) (575) 8357027

e-mail: kgolap@aoc.nrao.edu

Qualifications:

BOARD/UNIVERSITY	GRADES	YEAR
Higher School Certificate Cambridge Board	Physics A Maths A Chemistry A	Dec 1984
BSc. (Hon.) Physics Delhi University	1st Division	Jun 1988
MSc Physics Delhi University	1st Division	Jun 1990
Ph.D Physics University of Mauritius	*	1998

*Thesis: Synthesis Imaging at 151.5 MHz using the Mauritius Radio Telescope.

Thesis Supervisors: Prof. N. UdayaShankar and Prof Ch. V. Sastry

Ph.D Thesis abstract:

The Mauritius Radio Telescope (MRT) is an instrument which has been designed

to make a survey, of the southern sky, at a resolution of $4' \times 4' \sec(\delta - \phi)$ and a sensitivity of 70 mJy (1σ). The aim of this instrument is to fill in the lacuna in observations that exists, at metric wavelengths, for this region of the sky.

The design criteria and modifications while implementing the design are discussed in this thesis.

The calibration technique of the visibilities obtained from the MRT is described here. The use of celestial objects to estimate errors in the geometry of the array is also presented.

The basis for transit mode imaging large fields of view with non-planar arrays is discussed. The shape of the the resulting Point Spread Function (PSF) is derived. From this a technique to generate PSF's at all declinations for the MRT is presented. The basic information for estimating the PSF is extracted from the dirty image itself as this gives a better S/N ratio.

We present deconvolved images generated from MRT data, at a resolution of $13' \times 17' \sec(\delta - \phi)$.

From these images a source list is extracted. This list is used to confirm the primary beam of the helical antenna used in the array and to confirm the accuracy of the technique used in the system. We present a few comparisons with other surveys available in the southern declinations.

Positions held:

- Research Assistant, University of Mauritius (Sep 1990 - Jun 1994)
- Research Officer, University of Mauritius (Jul 1994 - Mar 2001)
- Head, Mauritius Radio Telescope (Jan 1997 - Dec 1997)
- Post Doctoral Fellow at the NRAO, with the AIPS++ group (Apr 1999 - Apr 2001)
- Assistant Scientist, AIPS++, NRAO (Apr 2001 - Jun 2004)
- Deputy Project Manager, CASA, (Dec 2002 - Sep 2008)
- Associate Scientist, CASA, NRAO (Jul 2004 - Dec 2010)
- Scientist, CASA, NRAO (Jan 2011 - present)

Experience:

- Teaching of different modules of BSc Physics at the University of Mauritius

- Worked on modeling the behaviour of solar corona at low frequencies. This included application of ray tracing techniques to anisotropic plasma in the presence of scattering objects.
- R.F and analogue electronics: Involved in designing, testing, modifying the R.F. part of the Mauritius Radio Telescope from the helical antennas to the second I.F. in the receiver room.
- Digital electronics: Participated in testing the correlator from the Clark Lake Radio Observatory which was subsequently adapted for use at the MRT. Worked on interfacing the correlator with PC's. Have been playing a major role in the maintenance of the MRT array and receiver while most of the data for the MRT survey have been collected.
- Contributed in the development of techniques to calibrate and image with the non-planar MRT array. Developed a technique to generate the PSF at every point on a wide field image so as to deconvolve images made from the MRT. Part of my Ph.D thesis is devoted to this problem of wide field imaging with a non-planar array. Contributed in programs which are used for calibrating, imaging, beam shifting and point source detection (mostly in C).
- Has been working with the CASA group at the NRAO, Socorro on the implementation of the widefield imaging algorithm and its parallelization. In the process, has learnt C++, glish script language, MPI standard and has gained experience on working on a large Object Oriented Project.
- Has been working on general synthesis imaging development and code maintenance in CASA/AIPS++ since April 2000. This include:
 - (i) Parallelization of wide-field facet imaging
 - (ii) Code profiling and optimization
 - (iii) Developement and implementation of new algorithms for imaging. This includes wide-field, mosaic, direction dependent corrections and interferometry and single dish combination
- CASA (formerly AIPS++) deputy project manager from Dec 2002 to Sept 2008
- Computer related languages:
 - (i) Assembly Language for 80x86 microprocessors
 - (ii) Python, Glish, Octave
 - (iii) Fortran
 - (iv) C
 - (v) C++
 - (vi) UML

Operating Systems:

- (i) DOS, used for acquisition of data
- (ii) Linux/Unix

Publications and Posters:

1. The Radio brightness of the Undisturbed solar corona in the presence of a radial magnetic field, Kumar Golap and Ch.V.Sastry, *Solar Physics*, 150, 295-304, 1994.
2. A calibration Scheme for the Mauritius Radio Telescope, K. Golap, R. Dodson and N Udaya Shankar, *Bull. Astron. Soc. of India*, 23, 574, 1995
3. The Mauritius Radio Telescope, K. Golap, N. Issur, R. Somanah, R. Dodson, M. Modgekar, S. Sachdev, N. Udaya Shankar and Ch. V. Sastry, *Astrophys. Sp. Sci*, 228, 373, 1995
4. A low frequency radio telescope at Mauritius for a Southern sky survey, K. Golap, N. Udaya Shankar, S. Sachdev, R. Dodson and Ch. V. Sastry, *J. Astrophys. Astr.*, 19, 35-53, 1998
5. On the association of G343.1-2.3 and PSR 1706-44, R. Dodson, K. Golap, A.P. Rao, N. UdayaShankar and J.L. Osborne,
6. Wide Field Imaging in AIPS++, K. Golap and T.J. Cornwell, Poster AAS 1999.
7. Radio Wave Scattering in the Solar Wind, Desai, K. M.; Golap, K.; Anantharamaiah, K. R., Poster, American Astronomical Society Meeting 197, #128.01
8. Parallelization of Widefield Imaging in AIPS++, Golap, K., Kemball, A.; Cornwell, T.; Young, W. *Astronomical Data Analysis Software and Systems X*, ASP Conference Proceedings, Vol. 238, p.408, 2000
9. Parallelization of Widefield Imaging in AIPS++, Golap, K., Kemball, A.; Cornwell, T.; Young, W., *Trends in Optics and Photonics Series*, Vol. 66, 2001
10. Deconvolution of Wide-field Images from a Non-Coplanar T-Array, Golap, K.; Shankar, N. Udaya, *Journal of Astrophysics and Astronomy*, Vol. 22, p. 213-228, 2001
11. On the association of G343.1-2.3 and PSR B1706-44, Dodson, R.; Golap, K., *Monthly Notices of the Royal Astronomical Society*, Volume 334, Issue 1, pp. L1-L5, 2002

12. PKS B1400-33: an unusual radio relic in a poor cluster, R. Subrahmanyam, A. J. Beasley, W. M. Goss, K. Golap, R. W. Hunstead, *The Astronomical Journal*, Volume 125, Issue 3, pp. 1095-1106, 2003
13. New High-Resolution Radio Observations of the Supernova Remnant CTB 80, G. Castelletti, G. Dubner, K. Golap, W. Goss, P. Velzquez, M. Holdaway, A.P. Rao, *The Astronomical Journal*, Volume 126, Issue 5, pp. 2114-2124, 2003
14. A Spectral Analysis of the Central Component of CTB 80, G. Castelletti, G. Dubner, K. Golap, W. Goss, *Young Neutron Stars and their Environment*, International Astronomical Union. Symposium no. 218, 14-17 July, 2003
15. The AIPS++ Project, J.P. McMullin, K. Golap, S.T. Myers, *ADASS XIII, ASP Conference Proceedings*, Vol. 314. San Francisco: Astronomical Society of the Pacific, 2004., p.468
16. Post Correlation RFI excision, K. Golap, T. Cornwell, R. Perley, S. Bhatnagar, *From Clark Lake to the Long Wavelength Array*, ASP Conf. Series, Vol 345, 2005., p.366
17. W Projection: A New Algorithm for Wide Field Imaging with Radio Synthesis Arrays, T.J. Cornwell, K. Golap, S. Bhatnagar, *Astronomical Data Analysis Software and Systems XIV ASP Conference Series*, Vol. 347, Ed. P. Shopbell, M. Britton, Astronomical Society of the Pacific, 2005., p.86
18. Mosaicing with interferometers: An Efficient Algorithm for Imaging and Image Plane Corrections, S. Bhatnagar, K. Golap, T.J. Cornwell, *Astronomical Data Analysis Software and Systems XIV ASP Conference Series*, Vol. 347, Ed. P. Shopbell, M. Britton, Astronomical Society of the Pacific, 2005., p.96
19. A High-resolution Polarimetric Survey of the Central 200 pc of the Galaxy, T.M. Freismuth, C.C. Lang, T.J. Lazio, K. Golap, 2007 AAS/AAPT Joint Meeting, American Astronomical Society Meeting 209, #172.16; *Bulletin of the American Astronomical Society*, Vol. 38, p.1149
20. New VLA observations of the SNR Puppis A: the radio properties and the correlation with the X-ray emission, G. Castelletti, G. Dubner, K. Golap, W.M. Goss, *A&A*, Vol 459, 2006, pp.535-544
21. CASA Architecture and Applications, J.P. McMullin, B. Waters, D. Schiebel, W. Young, K. Golap, *Astronomical Data Analysis Software and Systems XIV ASP Conference Series*, Vol. 76, Ed. R. Shaw, F. Hill, D.J. Bell, Astronomical Society of the Pacific, 2007., p.127

22. Correcting direction-dependent gains in the deconvolution of radio interferometric images, S. Bhatnagar, T.J. Cornwell, K. Golap, J. M. Uson, *Astronomy and Astrophysics*, Volume 487, Issue 1, 2008, pp.419-429
23. The Noncoplanar Baselines Effect in Radio Interferometry: The W-Projection Algorithm, T.J. Cornwell, K. Golap, S. Bhatnagar, *IEEE Journal of Selected Topics in Signal Processing*, Vol. 2, No. 5, October 2008, pp.647-657