

Lalitha Sairam

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RESEARCH INTERESTS

Coronal characterisation of low-mass solar neighbours, stellar activity and their influence on the exoplanet, flares on low mass stars and the propagation of such energy release events through all layers of the stellar atmosphere, atmospheres of ultra-cool dwarfs and brown-dwarfs, star-planet interaction.

EDUCATION

Hamburger Sternwarte, University of Hamburg, Germany

Ph.D. in Astronomy

Apr 2010 - May 2013

- Dissertation : Activity properties of potential planet hosts
- Areas of study : X-ray activity characterisation, stellar flares, activity cycle
- Advisor: Prof. J.H.M.M. Schmitt

Bangalore University, Bangalore, India

Master of Science in Physics

Jun 2006 - May 2008

- Dissertation : Study of faint young open clusters
- Advisor: Dr. S. Sujatha

Bachelor of Science

Jun 2003 - May 2006

RESEARCH EXPERIENCE

Tata Institute of Fundamental Research (TIFR), Mumbai, India

Visiting Post-doctoral fellow

Nov 2013 - present

Hamburger Sternwarte, Hamburg, Germany

Post-Doctoral scholar

May 2013 - Oct 2013

Indian Space Research Organisation (ISRO-ISAC), Bangalore, India

Junior research fellow

Jan 2009 - Mar 2010

M. P. Birla Institute of Fundamental Research (MPBIFR), Bangalore, India

Master of Science – Thesis

May 2007 - Mar 2008

TEACHING

Instructor for practical hands-on session based on fundamental astronomy for high school students, Hamburg, Germany, *Oct 2010 - Mar 2013*.

Teaching assistant for introduction to basic astronomy and astrophysics classes conducted for general public at M.P.Birla Institute of Fundamental Research, Bangalore, India, *Oct 2006 - Dec 2009*.

Basic physics lectures for pre-university students, Mount Carmel College, Bangalore, India, *Jun 2008 - Dec 2008*.

SUPERVISED
STUDENTS

Indian Institute of Technology Bombay (IIT-B) postgraduate student Ekta Shah; project – “Detection of sources around GJ 1214 region and their characterisation”, hosted at TIFR-Mumbai, *Jun - Oct 2014*.

COLLABORATIONS

Active member of CARMENES Consortium. I am responsible for the characterisation of the coronal emission from potential planet host stars.

Post-flare coronal loop oscillation studies using wavelet analysis in late-type stars. In collaboration with Dr. A. K. Srivastava, Aryabhata Research Institute of Observational Sciences (ARIES), Nainital.

Active member of ASTROSAT science team. Involved in simulation and analysis of soft X-ray telescope (SXT) data.

Understanding and characterising the X-ray emission of ultra-cool dwarfs. In collaboration with Prof. J.H.M.M. Schmitt, Hamburger Sternwarte, Hamburg.

Study of exoplanetary systems via transit timing variations. KOINET- A multi-site photometric follow-up of Kepler targets using middle-class telescopes around the world. In collaboration with Dr. C. von Essen, Georg-August-Universität and Stellar Astrophysics Centre (SAC), Aarhus university.

Accuracy of stellar parameters in planet hosting stars. Spectroscopic follow-up of well studied planet-hosts using 2.3m Vainu-Bappu telescope in India. In collaboration with Dr. C. von Essen, Stellar Astrophysics Centre (SAC), Aarhus university.

PUBLICATIONS

Refereed publication :

Lalitha, S., Singh, K.P., Drake, S., Kashyap, V., “X-raying the coronae of a young pre-main sequence system - HD 15555 ”, submitted in ApJ.

Lalitha, S., Poppenhaeger, K., Singh, K.P., Czesla, S., Schmitt, J.H.M.M., “X-ray emission from super-Earth host GJ 1214”, 2014, ApJ 790, id.L11

Srivastava, A.K., **Lalitha, S.**, Pandey, J.C., “Evidence of multiple slow acoustic oscillations in the stellar flaring loops of Proxima Centauri”, 2013, ApJ 778, id.L78

Lalitha, S., Schmitt, J.H.M.M., “X-ray activity cycle on the active ultra-fast rotator AB Doradus A?. Implication of correlated coronal and photometric variability”, 2013, A&A. 557, id.A119

Lalitha, S., Fuhrmeister, B., Wolter, U., Schmitt, J.H.M.M., Engels, D., Wieringa, M. H., “Multi-wavelength view of AB Dor A’s outer atmosphere : simultaneous high cadence observation in by X-ray & optical wavelengths”, 2013, A&A 560, id.A69

Poppenhaeger, K., Czesla, S., Schröter, S., **Lalitha, S.**, Kashyap, V., Schmitt, J.H.M.M., “The high-energy environment in the super-earth system CoRoT-7”, 2012, A&A 541, id.A26

Fuhrmeister, B., **Lalitha, S.**, Poppenhaeger, K., Rudolf, N., Liefke, C., Reiners, A., Schmitt, J.H.M.M., Ness, J.-U., “Multi-wavelength observations of Proxima Centauri”, 2011, A&A 534, id.A133

Publications in preparation:

Lalitha, S., Schmitt, J.H.M.M., “Outer atmosphere of an ultra-fast rotating low mass star - LO Peg”

Lalitha, S., Singh, K.P., Schmitt, J.H.M.M., “Coronal X-ray emission from the M/L dwarf binary LHS 2397a”

Lalitha, S., Schmitt, J.H.M.M., Singh, K.P., “Automated flare detection on AB Dor and its characterisation in soft X-rays over the last decade.”

Other publications :

Lalitha, S., Schmitt, J.H.M.M. “Outer atmospheres of low mass stars - flare characteristics”, ASP conference series, Vol. 472, 2013.

Srivastava, A.K., **Lalitha, S.**, “MHD seismology as a tool to diagnose the coronae of X-ray active sun-like flaring stars”, ASI conference series, Vol. 10, 2013.

Poppenhaeger, K., Günther, H.M., Beiersdorfer, P., Brickhouse, N.S., Carter, J.A., Hudson, H.S., Kowalski, A., **Lalitha, S.**, Miceli, M., and Wolk, S.J., “Non-thermal processes in coronae and beyond”, *Astronomical Notes* 334 1-2 101, 2013.

SUCCESSFUL
OBSERVING
PROPOSALS

“Optical observations to study quiescent variations of bright M dwarfs in solar neighbourhood”- using 2.34m Vainu Bappu telescope at VBO, Kavalur, India, carried out between 9-18th June 2012.

“Optical observations to characterise the low mass stars in CARMENES target list” using 2.34m Vainu Bappu Telescope, VBO, Kavalur, India , carried out between 3-12th November 2012.

“High energy irradiation and mass loss on the super earth GJ 1214b”, XMM-Newton proposal ID 072438, 28ks observation carried out in A0 11, 26 September 2013.

“Optical low resolution spectroscopy of Wasp-82 and LO Peg”, using 2m Himalayan Chandra Telescope, HCT, Hanle, India , 29th November 2014.

“The outer atmospheres of ultra-fast rotating active stars”, XMM-Newton proposal ID 074059 scheduled for 43 ks of observations on 30 November 2014.

“LO Peg - XMM newton simultaneous observation with TIGRE”, scheduled to be observed simultaneously with XMM-Newton observations on 30 November 2014.

POSTERS

“Characterisation of flares on AB Doradus A”, Astronomische Gesellschaft, Hamburg, Germany, September, 2012.

“X-ray characterisation of CARMENES samples”, Cool stars 17, Barcelona, Spain, June, 2012.

“A magnetic activity cycle in AB Doradus A ?”, Cool stars 17, Barcelona, Spain, June, 2012.

“Outer atmospheres of low mass stars”, 7th Potsdam Thinkshop on magnetic fields in stars and exoplanets, Potsdam, Germany, August, 2011.

CONTRIBUTED
TALKS

“In search of evidence for non-thermal emission in stars”, Conference on Hard X-ray Astronomy: Astrosat and Beyond, Goa, India, September, 2014.

“X-raying the stellar coronae using SXT onboard ASTROSAT”, ASTROSAT science working group, Bangalore, India, May, 2014.

“A multi-wavelength view of an active rapidly rotating low mass star using ASTROSAT”, ASTROSAT science working group, Bangalore, India, February, 2014.

“Solar-stellar connection: activity in low mass stars”, Northern Astronomy colloquium, Hamburg, Germany, June, 2013.

“Characterisation of flares on AB Doradus A”, Astronomische Gesellschaft, Hamburg, September, 2012.

“Relation between chromospheric evaporation and coronal heating - Neupert effect”, Cool stars 17 splinters on Non-thermal processes in coronae and beyond, Barcelona, Spain, June, 2012.

“Outer atmosphere of late-type mass stars - Flare characteristics”, New Quest in Stellar Astrophysics III , Puerto Vallarta, Mexico, March, 2012.

“Can Hamburg robotic telescope contribute to low-mass planet search survey like CARMENES?”, Hamburg Robotic telescope kickoff meet, Guanojuato, Mexico, March, 2012.

“X-ray properties and activity characterisation of low mass stars in solar neighbourhood”, CARMENES Science meet, Goetingen, Germany, October, 2011.

INVITED
TALKS

“Activity characterisation of potential planet hosts”, at Indian Space Research Organisation (ISRO-SAC), Bangalore, India, October 2012.

“Activity characterisation of potential planet hosts”, at Aryabhatta Research Institute of Observational Science (ARIES), Nainital, India, Oct-Nov 2012.

OTHERS

Co-organised a splinter session on “Frontiers in exoplanetary science”, Astronomische Gesellschaft e.V., Hamburg, September, 2012.