



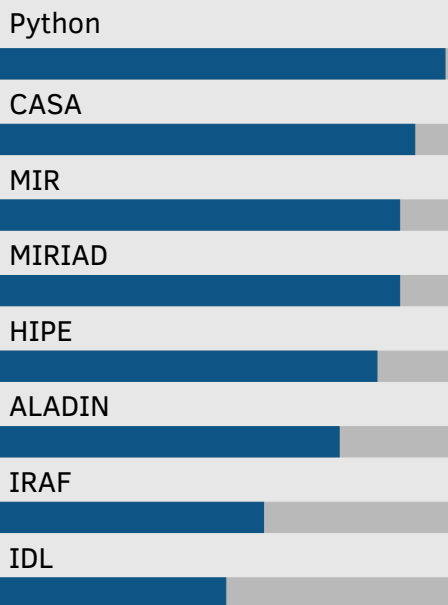
# Riwaj POKHREL

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## About me

PhD student in Astronomy department in the University of Massachusetts in Amherst, working on observational aspects of star formation with Prof. Robert Gutermuth.

## Skills



Matlab\*3 SQL\*4 Mathematica\*4  
 Latex\*5 Origin\*4 ds9\*5

(\*)[The skill scale is from 0 (Fundamental Awareness) to 6 (Expert).]

## Research interests

Star formation in Milky Way Galaxy; fragmentation of molecular clouds over multiple scale hierarchy; protostellar disk fragmentation; YSO evolution; resolved star formation in nearby galaxies

## Education

- 2012- **Ph.D. candidate in Astronomy**  
 University of Massachusetts, Amherst, USA  
 Dissertation advisor: Prof. Robert Gutermuth
- 2008-2012 **M.S. in Physics**  
 Tribhuvan University, Kathmandu, Nepal  
 Thesis advisor: Prof. Binil Aryal
- 2004-2007 **B.S. in Physics**  
 Trichandra College, Kathmandu, Nepal

## Research experience

- 2018- **Study of star-gas correlations in Mon R2 GMC, Cep OB3 GMC and Cygnus-X star forming complex.**  
 Data: *Herschel*, 2MASS, *Spitzer*  
 Advisor: Prof. Robert Gutermuth, UMass Amherst
- 2018 Spring **X-ray data reduction for studying the 6.4 KeV Fe-K $\alpha$  line in Cyg OB2 region.**  
 Data: *Chandra*  
 Advisor: Prof. Daniel Wang, UMass Amherst
- 2017- **Identification and characterization of a fragmenting Class 0 protostellar disk Serpens-FIRS1.**  
 Data: ALMA  
 Advisor: Asst. Prof. Michael Dunham, SUNY Fredonia
- 2017- **Kinematic study of protostellar envelopes in the Perseus molecular cloud using NH<sub>3</sub> observations.**  
 Data: VLA, GBT  
 Advisor: Dr. Philip Myers, Senior Astrophysicist, SAO
- 2016-2017 **Study of the hierarchical fragmentation over multiple scales in the Perseus molecular cloud.**  
 Data: *Herschel*, SCUBA, SMA, VLA  
 Advisor: Dr. Philip Myers, Senior Astrophysicist, SAO
- 2013-2015 **Investigating the column density distribution function in Mon R2 GMC.**  
 Data: *Herschel*, 2MASS  
 Advisor: Prof. Robert Gutermuth, UMass Amherst
- 2012-2013 **A multiwavelength study of age variations in the stellar populations of NGC 300 galaxy.**  
 Data: *GALEX*, SSO, Danish, 2MASS, *Spitzer*  
 Advisor: Prof. Daniella Calzetti
- 2010-2011 **Image and spectral analysis in NGC 3603 cloud in the Milky Way Galaxy.**  
 Data: NANTEN, *IRAS*  
 Advisor: Prof. Binil Aryal, Tribhuvan University

## Grants and Fellowships

- 2016-2018 **SAO Predoctoral Fellowship**  
 Advisor: Dr. Philip Myers, Senior Astrophysicist, SAO
- 2016 **NRAO student observing support grant**  
 ALMA: SOSP3-003

2014,2015	<b>Mary Dailey Irvine grad travel award</b> Umass Astronomy
2011	<b>International Center for Theoretical Physics Grant</b> Training on analytical and computational Astrophysics, ICTP, Trieste, Italy
2011	<b>Sardinia Summer School Grant</b> Sardinian summer school in Astrophysics, Pula, Italy
2010	<b>International Astronautical Federation youth grant award</b> International Astronautical Congress
2010	<b>IAU grant for presenting in CAP2010</b> Cape Town, South Africa
2009	<b>Grant for attending Astroparticle Physics school</b> Bose institute, Darjeeling, India

## Awarded observing proposals

2018	<b>Fragmentation of Serpens FIRS1: a Class 0 protostellar disk</b> Atacama Large Millimeter Array (ALMA)	Principal Investigator
2017	<b>Dense gas structures, envelope kinematics and multiplicity of protostars</b> Very Large Array (VLA)	Principal Investigator
2017	<b>Protostellar Multiplicity in Isolation</b> Atacama Large Millimeter Array (ALMA)	Co-Principal Investigator
2015	<b>Deep survey of protostellar and starless cores in Mon R2 GMC</b> Large Millimeter Telescope (LMT)	Principal Investigator
2015	<b>Detection and Characterization of Fragmentation in a Class 0 Disk</b> Atacama Large Millimeter Array (ALMA)	Co-Principal Investigator
2014	<b>Mass Assembly of Stellar Systems and their Evolution with the SMA</b> SubMillimeter Array (SMA)	Co-Principal Investigator

## Publications

### Published in peer-reviewed journals:

- "Hierarchical Fragmentation in the Perseus Molecular Cloud: From the Cloud Scale to Protostellar Objects"  
**Pokhrel, Riwaj**; Myers, Philip C.; Dunham, Michael M.; Stephens, Ian W.; et al.  
*The Astrophysical Journal*, v. 853, p. 5 (2018)
- "A Herschel-SPIRE survey of the Mon R2 giant molecular cloud: analysis of the gas column density probability density function"  
**Pokhrel, Riwaj**; Gutermuth, Robert; Ali, Babar; Megeath, Thomas; Pipher, Judith; et al.  
*Monthly Notices of the Royal Astronomical Society*, v. 461, p. 22 (2016)
- "Mass Assembly of Stellar Systems and Their Evolution with the SMA (MASSES) - 1.3 mm Subcompact Data Release"  
Stephens, Ian W.; Dunham, Michael M.; Myers, Philip C.; **Pokhrel, Riwaj**; Bourke, Tyler L.; et al.  
*The Astrophysical Journal Supplementary Series*, v. 237, p. 22 (2018)
- "ALMA Observations of Dust Polarization and Molecular Line Emission from the Class 0 Protostellar Source Serpens SMM1"  
Hull, Charles L. H.; Girart, Josep M.; Rao, Ramprasad; Cortés, Paulo C.; **Pokhrel, Riwaj**; et al.  
*The Astrophysical Journal*, v. 847, p. 92 (2017)
- "Alignment between Protostellar Outflows and Filamentary Structure"  
Stephens, Ian W.; Dunham, Michael M.; Myers, Philip C.; **Pokhrel, Riwaj**; Sadavoy, Sarah I.; et al.  
*The Astrophysical Journal*, v. 846, p. 16 (2017)

## Submitted:

- "Early science with the Large Millimeter Telescope: An LMT/AzTEC 1.1 mm Survey of Dense Cores in the Monoceros R2 Giant Molecular Cloud"  
Sokol, Alyssa D.; Gutermuth, Robert A.; **Pokhrel Riwaj**; et al.  
*Monthly Notices of the Royal Astronomical Society*, (Submitted)
- "Catalogue of High Protostellar Surface Density Regions in Nearby Embedded Clusters"  
Li, Juan; Myers, Philip C.; Kirk, Helen; Gutermuth, Robert; Dunham, Michael M.; and **Pokhrel, Riwaj**  
*The Astrophysical Journal*, (Submitted)
- "The mass evolution of protostellar disks and envelopes in the Perseus molecular cloud"  
Andersen, Bridget C.; Stephens, Ian W.; Dunham, Michael M.; **Pokhrel, Riwaj**; et al.  
*The Astrophysical Journal*, (Submitted)

## In prep.:

- "Star-gas correlations in Cygnus-X star forming complex"  
**Pokhrel, Riwaj**; Gutermuth, Robert; et al.  
*Monthly Notices of the Royal Astronomical Society*, (in prep.)
- "Fragmentation of Class 0 protostellar disk Serpens-FIRS1: Comparing Observation and simulations"  
**Pokhrel, Riwaj**; Dunham, Michael M.; Vorobyov, Eduard I.; et al.  
*The Astrophysical Journal*, (in prep.)

## Observing experience

2016 March	<b>SubMillimeter Array</b> Routine observation both on and off-site	Hilo, Hawaii
2015 November	<b>Large Millimeter Telescope</b> Observation, calibration and reduction of data	Puebla, Mexico
2012 April	<b>National observatory of Nepal</b> Observation and calibration of raw data	Nagarkot, Nepal

## Schools and training

2017 October	<b>6<sup>th</sup> VLA Data Reduction Workshop</b> Pete V. Domenici Science Operations Center	Socorro, NM
2017 January	<b>ALMA Data Reduction Party</b> NRAO headquarters	Charlottesville, VA
2016 February	<b>SMA data reduction</b> Harvard-Smithsonian Center for Astrophysics, courtesy: M. Dunham	Boston, MA
2016 January	<b>AAS Astronomy Ambassadors Workshop</b> 227 <sup>th</sup> Americal Astronomical Society meeting	Kissimmee, FL
2011 November	<b>School and conference on Analytical and Computational Astrophysics</b> Abdus Salam International Centre for Theoretical Physics	Trieste, Italy
2011 September	<b>Single-Dish Radio Astronomy and Radio Science</b> Sardinian Summer School in Astrophysics	Pula, Italy
2010 May	<b>8<sup>th</sup> National school on Astronomy and Astrophysics</b> B. P. Koirala Memorial Planetarium, Observatory and Science Museum Development Board	Kathmandu, Nepal
2009 December	<b>4<sup>th</sup> Winter School on Astroparticle Physics</b> Bose Institute and Tata Institute of Fundamental Research	Darjeeling, India
2004 January	<b>Seminar cum school on Astronomy and Astrophysics</b> B. P. Koirala Memorial Planetarium, Observatory and Science Museum Development Board	Kathmandu, Nepal

## Selected research talks

2018 January	<b>Hierarchical Fragmentation in the Perseus molecular cloud</b> [oral] 4 <sup>th</sup> MA-CT Regional Star Formation Meeting	Boston, MA
2017 September	<b>Distribution of protostars and gas in the Cep OB3 GMC</b> [oral] Southern Maine Astronomers, Astronomical Society of Northern New England	Portland, ME
2015 August	<b>N-PDF study of the Mon R2 GMC</b> [poster] XXIX IAU General Assembly	Honolulu, HI
2014 October	<b>Study of interstellar filaments in Mon R2 GMC</b> [poster] NRAO Filaments conference	Charlottesville, VA
2014 June	<b>A Herschel-SPIRE Survey of the MonR2 Giant Molecular Cloud</b> [poster] 224 <sup>th</sup> American Astronomical Society meeting	Boston, MA
2013 October	<b>Stellar age variation in arm and inter-arm regions of NGC 300 galaxy</b> [oral] Arunah Hill Star Watch	Cummington, MA
2012 March	<b>Image and spectral analysis in NGC3603</b> [oral] International Conference on Astrophysics and Cosmology	Kathmandu, Nepal
2011 November	<b>Mass and temperature estimates of NGC 3603 using spectroscopy</b> [poster] School and conference on Analytical and Computational Astrophysics	Trieste, Italy
2011 July	<b>PDR interface in NGC 3603</b> [poster] 11 <sup>th</sup> Asian-Pacific Regional IAU meeting	Chiangmai, Thailand
2011 June	<b>Photon dominated regions in molecular clouds</b> [oral] International Graduate Summer School on Aeronautics and Astronautics	Beijing, China
2010 October	<b>Spectral analysis of NGC 3603 using NANTEN data</b> [poster] International conference on Accretion and outflow in Black hole systems	Kathmandu, Nepal

## Teaching and Mentoring

2018 Summer	<b>Undergrad mentor [Classification of YSOs including data beyond mid-IR]</b> Umass, Amherst; in conjunction with Prof. Robert Gutermuth
2013-2015	<b>Lead teaching assistant for Astronomy lab [Fully instructing the labs]</b> Umass, Amherst
2012-2014, 2018 Spring	<b>Teaching Assistant for ASTRO100 and ASTRO101</b> Umass, Amherst
2009-2012	<b>High school Physics Instructor</b> Sagarmatha Institutional Academy, Nepal

## Involvements

2014-	<b>American Astronomical Society</b> Junior member
2013-	<b>Southern Maine Astronomers</b> Member
2013-	<b>Astronomical Society of Northern New England</b> Member
2013-2017	<b>North East Astronomy Forum</b> Volunteer
2012-	<b>Astrophysics and Cosmology Research Group, CDP</b> Member
2012 March	<b>International Conference on Astrophysics and Cosmology</b> Local Organizing Committee Member
2011 March	<b>Galileo teacher training program in Kathmandu</b> Scientific and Local Organizing Committee Member

2009-2012	<b>Astronomers Without Borders</b> National Coordinator for Nepal
2009-2012	<b>Campaign Against Light Pollution in Nepal</b> Executive Member
2007-2012	<b>Nepal Astronomical Society</b> Co-Founder and Executive Member

### Selected non-research talks

2016 September	<b>Exoplanet detection methods</b> [oral] Annual STARFEST event	Kennebunk, ME
2015 September	<b>From Gas to Stars: A synopsis</b> [oral] Aronah Hill Natural Science Center	Cumington, MA
2015 March	<b>From dust and gas to protostars: Star formation</b> [oral] Southern Maine Astronomers, Astronomical Society of Northern New England	Portland, ME
2012 August	<b>Importance of professional-amateur collaboration in Astronomy</b> [oral] Maine State Star Party	Cobscook bay, ME
2011 July	<b>Astronomy education, popularization and its impacts in Nepal</b> [oral] 11 <sup>th</sup> Asian-Pacific Regional IAU meeting	Chiangmai, Thailand
2010 March	<b>Impacts of Astronomical Outreach in Nepalese Society</b> [oral] Communicating Astronomy with the public	Cape Town, South Africa
2008 July	<b>Importance of amateur astronomy and Outreach</b> [oral] "The Quanta" exhibition	Kathmandu, Nepal

### Outreach and Education

The following lists "some" of my contributions in (co)organizing and/or coordinating outreach and education activities. For full details of these programs, associated reports, and other activities please visit <http://astronomy-nepal.blogspot.com/>.

2012 June	<b>Transit of Venus</b> Observation program for students and public	Kathmandu, Nepal
2012 April	<b>Galileo Teacher Training Program</b> Hands-on training for school students	Kathmandu, Nepal
2011 December	<b>Hello Jupiter!</b> Talk, solar and night time observing, specially focusing on Jupiter	Damak, Nepal
2011 November	<b>Night sky observation in Tokha</b> Mostly observation of Saturn's rings and M42	Kathmandu, Nepal
2011 March	<b>First Man in Space</b> Celebrating 50th anniversary of the first man in space	Kathmandu, Nepal
2011 January	<b>Quadrantid Meteor Shower Observation</b> Two nights program, hundreds of participants	Nagarkot, Nepal
2010 December	<b>Geminid Meteor Shower Observation Program</b> One night program, hundreds of participants	Nagarkot, Nepal
2010 November	<b>Astro Book Drive- Nepal</b> Program to establish Astronomy library in Nepal	Kathmandu, Nepal
2010 May	<b>Astronomy school for kids in remote Parasi</b> Four days school for under privileged children	Parasi, Nepal
2010 April	<b>Global Astronomy Month: A cornerstone project of IYA2009</b> Exploration of Chhatedhunga (stone henge of Nepal)	Terhathum, Nepal
2010 February	<b>Sun observation using optical filter</b> Coordinated the observing session; "The Quanta" exhibition	Kathmandu, Nepal
2010 January	<b>Annular Solar Eclipse Observation</b> Hundreds of participants, LIVE telecast in Sagarmatha channel	Kathmandu, Nepal

2009 November	<b>Grand Astronomy Outreach to Celebrate International Year of Astronomy</b> More than thousand participants	Bhaktapur, Nepal
2009 November	<b>Leonids Outburst Observation Campaign 2009 in Nepal</b> More than hundred shower watchers	Nagarkot, Nepal
2009 October	<b>Public observation program in Far Western Nepal</b> More than two thousand participants	Dhangadhi, Nepal
2009 September	<b>Star party to celebrate World peace</b> Observation and talk for school students	Kathmandu, Nepal
2009 July	<b>Total Solar Eclipse Observation</b> Thousands observed TSE including the Prime Minister of Nepal	Kathmandu, Nepal
2009 April	<b>100 hours of Astronomy</b> A cornerstone project of IYA2009	Kathmandu Nepal
2009 February	<b>Come see comet Lulin!</b> Observation and talk regarding then visible comet- Lulin	Kathmandu, Nepal
2008 November	<b>International Year of Astronomy 2009</b> Introduction to IYA2009 and plans to celebrate it in Nepal	Kathmandu, Nepal
2007 August	<b>Perseid Meteor shower Observation Program</b> Observation program for locals and students	Kathmandu, Nepal