

MUBDI RAHMAN

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Research Interests

Data-Driven Astronomy: Large Dataset Astronomy; Statistical Inference; Distributed & GPU Computing; Visualization;
Extragalactic & Cosmology: Redshift Inference; Spatial Clustering; Intensity Mapping;
Star Formation: Galactic Massive Star Clusters and Associations; Stellar Feedback; Observations & Simulations;

Academic History

09/2015 – 08/2017 **Assistant Research Scientist**, Department of Physics & Astronomy, Johns Hopkins University
05/2016 – 08/2016 **Visiting Scientist**, Department of Astrophysics, Radboud University Nijmegen
09/2012 – 08/2015 **Postdoctoral Fellow**, Department of Physics & Astronomy, Johns Hopkins University
06/2012 **Ph.D. (Astronomy & Astrophysics), University of Toronto**, Supervisors: C. Matzner & D-S. Moon
Thesis Title: The Milky Way's Most Luminous Star Clusters: Engines of Galaxy Evolution
05/2007 **Hons. B. Sc. (Astronomy & Physics), University of Toronto**

Selected Scholarships & Awards

09/2016 **Dean's Teaching Postdoctoral Fellowship**, Johns Hopkins University
02/2012 **Fieldus Award**, University of Toronto, Department of Astronomy & Astrophysics
01/2012 **Rodger Doxey Travel Prize Honorable Mention**, American Astronomical Society
04/2011 **Adel S. Sedra UTAA Graduate Scholar**, University of Toronto
04/2007 **Gordon Cressy Student Leadership Award**, University of Toronto

Selected Invited Talks

06/2017	Johns Hopkins University , Second Annual Intensity Mapping Workshop	10/2013	University of Pennsylvania , Astronomy Seminar
06/2016	Radboud University Nijmegen , Seminar	05/2013	National Research Council Herzberg , Colloquium
02/2016	University of Toronto , Colloquium	04/2013	University of Delaware , Astronomy Seminar
08/2015	Perimeter Institute , Cosmic Flows Workshop	01/2013	Goddard Space Flight Center, NASA , Stellar and Extragalactic Astronomy Lunch
03/2014	University of Pittsburgh , AstroLunch		
11/2013	Johns Hopkins University , JHU/Goddard Interaction Day		

Selected Observing Time

2014	PI, 150 ks, Chandra X-Ray Observatory, Cycle 16: "X-Ray Investigation of the Most Luminous OB Association in the Galaxy"	2011	PI, 25.5 Hours, Expanded Very Large Array, Semester 11B: "Continuum Component-Separated Mapping of SINGS Galaxies: Pilot Study of NGC 2403"
2014	Co-I, 9 Orbits, Hubble Space Telescope, Cycle 22: "The Smith Cloud: Galactic or Extragalactic?" (PI: A. Fox)	2011	PI, 50 Hours, Mopra Telescope, April 2011 Semester: "Mapping the Natal Molecular Cloud of the Dragonfish Cluster"
2013	Co-I, 6 Orbits, Hubble Space Telescope, Cycle 21: "Siblings of Massive Stars: Extreme End of the Companion Mass Function" (PI: S.E. De Mink)	2010	PI, 5 Nights, NTT SOFI, Semester 86: "Near Infrared Spectroscopy of Candidate O-stars in the Candidate Massive Cluster at G298.4 -0.4"
2013	Co-I, 1 Orbit, Hubble Space Telescope, Cycle 21: "The massive monsters living deep in the Tarantula nebula" (PI: S. E. De Mink)		

Students Supervised

- 2016 – 2017 Patrick Breyse (PhD Project, paper: 2017, MNRAS, 468, 741)
2013 – 2016 Zack Dugan (PhD Project, paper: 2017, ApJ, 839, 103), co-supervised with Prof. J. Silk
2010 – 2011 Brent Arsenault (Summer Project & Undergraduate Thesis), co-supervised with Prof. C. Matzner
2010 – 2011 Eve Lee (Summer Project & Undergraduate Thesis, paper: 2012, ApJ, 752, 146), co-supervised with Prof. N. Murray (currently Postdoctoral Fellow at Caltech)
2010 Heidi White (Undergraduate Summer Project), co-supervised with Prof. C. Matzner (currently Graduate Student at University of Toronto)
2007 Lisa Einstein (High School Summer Internship), co-supervised with Prof. P. G. Martin

Selected Teaching Experience

- 2015-2017 Lead Curriculum Developer & Instructor: Physics & Astronomy Python Workshop, *Johns Hopkins University*
2016 Instructor, AS.171.127: The Unsolved Mysteries of the Cosmos, *Johns Hopkins University*
2014 Instructor, AS.171.216.13: The Unsolved Mysteries of the Cosmos, *Johns Hopkins University*
2011 – 2012 Tutorial and Laboratory Leader, AST 325/326: Practical Astronomy, *University of Toronto*
2010 – 2011 Teaching Assistant, AST 221H1F: Stars and the Solar System and AST 222H1S: Galaxies & Cosmology, *University of Toronto*
2010 Head Teaching Assistant, AST 201H1S: Stars and Galaxies, *University of Toronto*

Selected Outreach Activities

- 2009 – 2016 **Coordinator, Various Projects**, Canada Wide Science Fair, Youth Science Canada (*National Championship Science Fair for Gr. 7-12*)
2012 **Organizing Committee**, Transit of Venus Public Viewing Event, University of Toronto (*5000 Attendees*)
2008 – 2010 **Site Chair**, Science Rendezvous at the University of Toronto, University of Toronto (*Day long outdoor science festival, 25 000 Attendees over 3 years*)
2006 – 2009 **FIRST Robotics Competition Mentor**, West Humber Collegiate Institute, Toronto, Ontario

Selected Service Activities

- 2016 – 2017 **Organizer**, Visualization Discussion Group, JHU
2013 – 2015 **Organizer**, Astro-ph Discussion Group, JHU
2012 – 2014 **Organizing Committee**, CoolSci & HotSci Seminar Series, STScI and JHU
02/2011 **Symposium Chair**, Science Illustrated: A Symposium on Visualizing Science, University of Toronto (*200 Attendees*)
05/2009 **Local Organizing Committee**, Annual General Meeting of the Canadian Astronomical Society, University of Toronto (*300 Attendees*)
07/2008 **Conference Co-Chair**, Local Organizing Committee, Workshop on Parallel Computing in Astrophysics, Canadian Institute for Theoretical Astrophysics (*60 Attendees*)

References

Christopher Matzner

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Norman Murray

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Joe Silk

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Refereed Publications

First Author Publications

7. **Rahman, M.**, Mendez, A.J., Ménard, B., Scranton, R., Schmidt, S., Morrison, C., Budavári, T., “Exploring the SDSS photometric galaxies with clustering redshifts”, 2016, MNRAS, 460, 163
6. **Rahman, M.**, Ménard, B., Scranton, R., “Exploring the 2MASS extended and point source catalogues with clustering redshifts”, 2016, MNRAS, 457, 3912
5. **Rahman, M.**, Ménard, B., Scranton, R., Schmidt, S., Morrison, C., “Clustering-based Redshift Estimation: Comparison to Spectroscopic Redshifts”, 2015, MNRAS, 447, 3500
4. **Rahman, M.**, Matzner, C.D., Moon, D-S., “OB Associations at the Upper End of the Milky Way Luminosity Function”, 2013, ApJ, 766, 135
3. **Rahman, M.**, Moon, D-S., Matzner, C. D., “Spectroscopic Confirmation of the Dragonfish Association: The Galaxy’s Most Luminous OB Association”, 2011, ApJL, 743, 28
2. **Rahman, M.**, Matzner, C. D., Moon, D-S. “A Candidate for the Most Luminous OB Association in the Galaxy”, 2011, ApJL, 728, 37
1. **Rahman, M.**, Murray, N. “A New Sample of Very Massive Star Forming Complexes in the Spitzer Glimpse Survey”, 2010, ApJ, 719, 1104

Contributing Author Publications

16. Ochsendorf, B., Zinnecker, H., Nayak, O., Bally, J., Meixner, M., Jones, O., Indebetouw, R., **Rahman, M.**, “The star-forming complex LMC-N79 as a future rival to 30 Doradus”, 2017, Nature Astronomy, 1, 784
15. Kovetz, E., Raccanelli, A., **Rahman, M.**, “Cosmological Constraints with Clustering-Based Redshifts”, 2017, MNRAS, 468, 3650
14. Breyse, P., **Rahman, M.**, “Feeding Cosmic Star Formation: Exploring High-Redshift Molecular Gas with CO Intensity Mapping”, 2017, MNRAS, 468, 741
13. Ochsendorf, B., Meixner, M., Roman-Duval, J., **Rahman, M.**, & Evans, N., “Massive Star Formation Rates and Efficiencies of Giant Molecular Clouds”, 2017, ApJ, 841, 109
12. SDSS collaboration inc. **Rahman, M.**, “The Thirteenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-IV Survey MApping Nearby Galaxies at Apache Point Observatory”, 2017, ApJS, 233, 25
11. Dugan, Z., Gaibler, V., Bieri, R., Silk, J., & **Rahman, M.**, “AGN Outflow Shocks on Bonner-Ebert Spheres”, 2017, ApJ, 839, 103
10. Lee, B., Budavari, T., Basu, A., & **Rahman, M.**, “Galaxy Redshifts from Discrete Optimization of Correlation Functions”, 2016, AJ, 152, 155
9. Fox, A.J, Lehner, N., Lockman, F.J., Wakker, B.P., Hill, A.S., Heitsch, F., Stark, D.V., Barger, K.A., Sembach, K.R., **Rahman, M.**, “On the Metallicity and Origin of the Smith High-velocity Cloud”, 2016, ApJL, 816, 11
8. Alam, S., SDSS-III collaboration inc. **Rahman, M.**, “The Eleventh and Twelfth Data Releases of the Sloan Digital Sky Survey: Final Data from SDSS-III”, 2015, ApJS, 219, 12
7. Newman, J., LSST-DESC Photometric Redshift Collaboration inc. **Rahman, M.**, “Spectroscopic Needs for Dark Energy Experiments”, 2015, Astroparticle Physics, 63, 81
6. Schmidt, S., Ménard, B., Scranton, R., Morrison, C., **Rahman, M.**, Hopkins, A., “Inferring the Redshift Distribution of the Cosmic Infrared Background”, 2015, MNRAS, 446, 2696
5. Ahn, C., SDSS-III collaboration inc. **Rahman, M.**, “The Tenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-III Apache Point Observatory Galactic Evolution Experiment”, 2014, ApJS, 211, 17

4. Ménard, B., Scranton, R., Schmidt, S., Morrison, C., Jeong, D., Budavari, T., **Rahman, M.**, “*Estimating redshift distributions with spatial correlations: method and application to data*”, MNRAS, submitted, arXiv:1303.4722
3. Lee, H-G., Moon, D-S., Koo, B-C., **Rahman, M.**, et al., “*Wide Integral-field Infrared Spectroscopy of the Bright [Fe II] Shell in the Young Supernova Remnant G11.2-0.3*”, 2013, ApJ, 770, 143
2. Lee, E.J., Murray, N., **Rahman, M.**, “*Milky Way Star-forming Complexes and the Turbulent Motion of the Galaxy’s Molecular Gas*”, 2012, ApJ, 752, 146
1. Murray, N., **Rahman, M.** “*Star Formation in Massive Clusters Via the Wilkinson Microwave Anisotropy Probe and the Spitzer Glimpse Survey*”, 2010, ApJ, 709, 424

Non-Refereed Publications

4. Kollmeier, J., SDSS-V Collaboration inc. **Rahman, M.** “*SDSS-V: Pioneering Panoptic Spectroscopy*”, White paper to community, arXiv:1711.03234
3. Kovetz, E., Viero, M., Lidz, A., Newburgh, L., **Rahman, M.**, Switzer, E., et al., “*Line-Intensity Mapping: 2017 Status Report*”, 2017, White paper from Intensity Mapping Workshop, arXiv:1709.09066
2. Schmidt, S., LSST DESC Photometric Redshift Collaboration inc. **Rahman, M.** “*Spectroscopic Needs for Calibration of LSST Photometric Redshifts*”, 2014, White paper submitted to the National Research Council Committee on a Strategy to Optimize the U.S. O/IR System in the Era of the LSST
1. Abate, A., LSST DESC Photometric Redshift Collaboration inc. **Rahman, M.** “*Spectroscopic Needs for Training of LSST Photometric Redshifts*”, 2014, White paper submitted to the National Research Council Committee on a Strategy to Optimize the U.S. O/IR System in the Era of the LSST