### Maxime J. Rizzo

CONTACT INFORMATION Department of Astronomy University of Maryland PSC Bldg., Rm 1260, Stadium Dr. College Park, MD 20742, USA Phone: (301) 405–1530 mrizzo@astro.umd.edu www.astro.umd.edu/~mrizzo French Citizen & US Permanent Resident

**EDUCATION** 

### University of Maryland, College Park, MD

Ph.D., Astronomy, expected 2016

- Thesis title: Observing star-forming regions at high angular resolution with SOFIA and BETTII
- Advisors: Professor Lee Mundy (University of Maryland), Dr. Stephen Rinehart (NASA Goddard Space Flight Center)
- Areas of Study: Instrumentation, Star Formation

### University of Maryland, College Park, MD

M.S., Astronomy, 2010-2012

- Thesis Title: A Fringe-Tracking Testbed for BETTII
- Advisors: Professor Lee Mundy (University of Maryland),
   Dr. Stephen Rinehart (NASA Goddard Space Flight Center)
- Area of Study: Instrumentation
- GPA: 4.0

#### Observatoire Midi-Pyrénées, Toulouse, France

M.S., Astrophysics, 2009-2010

- Thesis title: Finding the Needles in the Haystacks: Realistic Simulations of Extrasolar Planet Observations
- Advisor: Dr. Aki Roberge (NASA Goddard Space Flight Center)
- Areas of Study: Debris disks, exoplanets, orbital dynamics

#### Institut Supérieur de l'Aéronautique et de l'Espace, Toulouse, France

M.S., Aerospace Engineering, 2006-2010

• Area of Study: Space Systems and Instrumentation

## RESEARCH EXPERIENCE

## **Research Assistant**

August 2010 - Present

Department of Astronomy, University of Maryland (Advisor: L.G. Mundy)

- Using SOFIA to observe nearby dense star-forming clusters in the far-infrared.
- Using CARMA to study filaments in the Serpens and Perseus molecular clouds.

#### Research Assistant

January 2011 – Present

NASA Goddard Space Flight Center, Greenbelt, MD (Advisor: S.A. Rinehart)

- Deputy project manager for a balloon-borne far-infrared interferometer, the Balloon Experimental Twin Telescope for Infrared Interferometry (BETTII).
- Responsible for the control system design, implementation, and testing.

#### Research Assistant

January – June 2009

French Space Agency, Toulouse, France (Advisor: J.-M. Le Duigou)

- Designed and modeled a Mach-Zehnder nulling interferometer for PERSEE
- Modeled electric field propagation in optical fibers.

## Research Assistant

Jun – Dec 2008

NASA Goddard Space Flight Center, Greenbelt, MD (Advisor: R.G. Lyon)

- Designed and built a testbed for the Visible Nulling Coronagraph instrument.
- Used phase retrieval techniques with segmented deformable micro-mirrors to improve null stability.

STUDENT MENTORSHIP	Undergraduate Student Advisor  Provided summer and academic year research experiences for undergradu BETTII project: daily interaction, task assignment, instruction, and supervi	•	
LEADERSHIP EXPERIENCE	NASA GSFC Instrumentation Journal Club  Created and advertised for the club Organized bi-weekly meetings, papers selected by vote	Fall 2013 – Fall 2014	
	<ul> <li>NASA Academy Leadership Program at Goddard Space Flight Center</li> <li>Intensive leadership training for future space leaders from around the w</li> <li>Selected by the French Space Agency to represent France</li> <li>Group research: Roadmap to a Space-Faring Civilization</li> </ul>		er 2008
AWARDS	Wilson Prize for Excellence in Research (UMD Astronomy Dept.)		2016
	Ann G. Wylie Dissertation Fellow (UMD Graduate School)		2016
	American Astronomical Society Chambliss Astronomy Achievement Stude	nt Award	2015
	NASA GSFC Honor Award for Mentoring awarded to BETTII team		2014
	Distinguished Teaching Assistant Award (UMD Astronomy Dept.)		2012
	International Teaching Fellow (UMD Graduate School)		2011
	Google Lunar XPrize Student Competition Winner: Technical Achievemen	t Award	2008
	Winner of nationwide competition to represent France at NASA Academy		2008
INVITED TALKS	• NASA Headquarters, Washington, DC BETTII: A balloon-borne experiment for sub-arcsecond angular resolution in the far-infrared	No	ov 2015
	• Lockheed Martin, Advanced Technology Center, Palo Alto, CA The Balloon Experimental Twin Telescope for Infrared Interferometry: The path towards high angular resolution in the far-infrared	Jun	ne 2015
	• NASA GSFC SED Director's Seminar, Greenbelt, MD BETTII: the path towards space-based far-IR interferometry	Apr	il 2015
	• SOFIA teletalk series, teleconference SOFIA multi-wavelength observations of dense star forming clusters	Februar	y 2015
	• Far-Infrared Science Interest Group Meeting, Seattle, WA  The Balloon Experimental Twin Telescope for Infrared Interferometry	Januar	ry 2015
	• CRESST Retreat, USRA Headquarters, Columbia, MD Observing star formation in dense cluster environments	Novembe	er 2014
	<ul> <li>Exoplanet Club, Goddard Space Flight Center, Greenbelt, MD         Finding the Needle in the Haystack: Realistic Simulations of Extrasolar I     </li> </ul>		ne 2010 ervations
CONTRIBUTED TALKS	• American Astronomical Society, Kissimmee, FL High angular resolution observations of star-forming regions with BET		ry 2015 IA
	• 3rd FISICA Workshop, London, UK  The Balloon Experimental Twin Telescope for Infrared Interferometry	Decembe	
	<ul> <li>2nd FISICA Workshop, Maynooth, Ireland Spectral sensitivity of Double-Fourier Interferometers</li> </ul>	Januar	ry 2015
	• Optical Society of America: Fourier Transform Spectroscopy, Arlington, VA  A control system for BETTII: enabling far-IR, balloon-borne Spectroscopy		
	• SPIE: Optical and Infrared Interferometry, Amsterdam, Netherlands	Jun	e 2012

Tracking near-infrared fringes on BETTII: a balloon-borne, 8m-baseline interferometer

# WHITE PAPER CONTRIBUTIONS

- [1] **Rizzo, M. J.**, S. A. Rinehart, D. J. Benford, L. G. Mundy, D. T. Leisawitz, 2015, white paper to the NASA COPAG: *Probe-class mission concepts in the far-infrared*
- [2] L. Armus, J. Bauer, D. Benford, E. Bergin, A. Bolatto, C.M. Bradford, C. Chen, A. Cooray, N. Evans, D. Farrah, J. Glenn, P. Goldsmith, A. Harris, G. Helou, D. Leisawitz, D. Lis, P. Marcum, G. Melnick, S. Milam, L. Mundy, D. Neufeld, K. Pontoppidan, A. Pope, M. J. Rizzo, K. Sandstrom, K. Sheth, E. Wright, 2015, white paper to the NASA COPAG: From Early Galaxies to Habitable Planets: The Science Case and Concept for a Far-Infrared Surveyor
- [3] Leisawitz, D. T., L. G. Mundy, M. J. Rizzo, and the members of the Space Infrared Interferometric Telescope (SPIRIT) Study Team, white paper to the far-infrared Science Interest Group, 2015: *Interferometry concept for the far-infrared surveyor*

# REFEREED PUBLICATIONS

- [1] Rizzo M. J., L. G. Mundy, S. A. Rinehart, A. Dhabal, R. Juanola-Parramon, D. J. Fixsen, D. T. Leisawitz, D. J. Benford, T. J. Veach, 2015, PASP 127, 1045: Far-infrared double-Fourier interferometers and their spectral sensitivity. DOI: 10.1086/683176
- [2] Rinehart, S. A., M. J. Rizzo, D. J. Benford, D. J. Fixsen, T. J. Veach, A. Dhabal, D. T. Leisawitz, L. G. Mundy, R. F. Silverberg, R. K. Barry, J. G. Staguhn, R. Barclay, J. E. Mentzell, M. Griffin, P. A. R. Ade, E. Pascale, G. Klemencic, G. Savini, and R. Juanola-Parramon, 2014, PASP 126, 660: The Balloon Experimental Twin Telescope for Infrared Interferometry (BETTII): An Experiment for High Angular Resolution in the Far-Infrared. DOI: 10.1086/677402

# CONFERENCE PROCEEDINGS

- [1] Rizzo, M. J., S. A. Rinehart, J. B. Alcorn, R. B. Barclay, R. K. Barry, D. J. Benford, A. Dhabal, D. J. Fixsen, A. S. Gore, S. Johnson-Shapoval, D. T. Leisawitz, S. F. Maher, L. G. Mundy, A. Papageorgiou, E. Pascale, A. Rau, R. F. Silverberg, P. Taraschi, T. J. Veach, and S. Weinreich, 2014, SPIE 9143: Building an interferometer at the edge of space: pointing and phase control system for BETTII.
- [2] Veach, T. J., E. Mentzell, S. Rinehart, D. J. Fixsen, M. J. Rizzo, D. J. Benford, A. Dhabal, 2014, SPIE 9143: *The balloon experimental twin telescope for infrared interferometry (BETTII): optical design.*
- [3] Rinehart, S., M. J. Rizzo, T. Veach, A. Dhabal, D. J. Benford, R. F. Silverberg, D. J. Fixsen, R. K. Barry, R. Barclay, J. Staguhn, S. F. Maher, D. Leisawitz, L. G. Mundy, and C. Jhabvala, 2014, SPIE 9146: The balloon experimental twin telescope for infrared interferometry (BETTII): interferometry at the edge of the atmosphere.
- [4] Rizzo, M. J., S. A. Rinehart, R. K. Barry, D. J. Benford, D. J. Fixsen, T. Kale, D. T. Leisawitz, R. G. Lyon, E. Mentzell, L. G. Mundy, and R. F. Silverberg, 2012, SPIE 8445: Tracking near-infrared fringes on BETTII: a balloon-borne, 8m-baseline interferometer.
- [5] Rinehart, S. A., R. B. Barclay, R. K. Barry, D. J. Benford, P. C. Calhoun, D. J. Fixsen, E. T. Gorman, M. L. Jackson, C. A. Jhabvala, D. T. Leisawitz, S. F. Maher, J. E. Mentzell, L. G. Mundy, M. J. Rizzo, R. F. Silverberg, and J. G. Staguhn, 2012, SPIE 8445: Design and status of the Balloon Experimental Twin Telescope for infrared interferometry (BETTII): an interferometer at the edge of space.
- [6] Benford, D. J., D. J. Fixsen, S. A. Rinehart, M. J. Rizzo, S. F. Maher, and R. K. Barry, 2012, SPIE 8444: *Precision attitude control for the BETTII balloon-borne interferometer*.
- [7] Lyon, R. G., M. Clampin, R. A. Woodruff, G. Vasudevan, P. Thompson, P. Petrone, T. Madison, M. J. Rizzo, G. Melnick, and V. Tolls, 2009, SPIE 7440: Visible nulling coronagraph testbed results.

# POSTER PRESENTATIONS

- [1] Rizzo, M. J., Rinehart, S. A., D. J. Benford, D. J. Fixsen, T. J. Veach, A. Dhabal, D. T. Leisawitz, L. G. Mundy, R. F. Silverberg, R. K. Barry, J. G. Staguhn, R. Barclay, J. E. Mentzell, M. Griffin, P. A. R. Ade, E. Pascale, G. Klemencic, G. Savini, and R. Juanola-Parramon, 2015, 2nd FISICA Workshop, Maynooth, Ireland: *The Balloon Experimental Twin Telescope for Infrared Interferometry (BETTII): An Interferometer at the Edge of Space*
- [2] **Rizzo, M. J.**, L. G. Mundy, S. Rinehart, D. J. Benford, X. Koenig, D. Leisawitz, J. D. Adams, and L. D. Keller, 2015, AAS 225: *SOFIA multi-wavelength observations of nearby star-forming clusters*. This poster won the AAS Chambliss Student Prize.
- [3] Mundy, L. G., S. Storm, M. J. Rizzo, L. Looney, C.-Y. Chen, E. C. Ostriker, K. I. Lee, and C. Team, 2015, AAS 225: *Kinematics of Filaments in Perseus and Serpens: Testing Filament Formation*.
- [4] Rinehart, S., M. J. Rizzo, T. Veach, A. Dhabal, D. J. Benford, R. F. Silverberg, D. J. Fixsen, R. K. Barry, R. Barclay, J. Staguhn, S. F. Maher, D. Leisawitz, L. G. Mundy, and C. Jhabvala, 2014, AAS 223: The Balloon Experimental Twin Telescope for Infrared Interferometry (BETTII): System Design, Progress, and Plans.
- [5] Rizzo, M. J., Rinehart, S. A., D. J. Benford, D. J. Fixsen, T. J. Veach, A. Dhabal, D. T. Leisawitz, L. G. Mundy, R. F. Silverberg, R. K. Barry, J. G. Staguhn, R. Barclay, J. E. Mentzell, M. Griffin, P. A. R. Ade, E. Pascale, G. Klemencic, G. Savini, and R. Juanola-Parramon, 2014, Far-IR community workshop, NASA GSFC: The Balloon Experimental Twin Telescope for Infrared Interferometry (BETTII): An Interferometer at the Edge of Space.
- [6] Rizzo, M. J., S. Rinehart, D. J. Benford, A. Dhabal, D. J. Fixsen, D. Leisawitz, and L. G. Mundy, 2014, AAS 223: The Balloon Experimental Twin Telescopes for Infrared Interferometry (BETTII): targets and calibration.
- [7] Wilkins, A. N., A. Roberge, M. J. Rizzo, E. Nesvold, C. C. Stark, M. W. McElwain, M. J. Kuchner, T. D. Robinson, V. Meadows, A. Straughn, and M. C. Turnbull, 2014, AAS 223: Finding the Needle in the Haystack: A High-Fidelity Model of the Solar System for Simulating Exoplanet Observations.