

Curriculum Vitæ of Massimo Marengo

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RESEARCH INTERESTS

- **Stellar Astrophysics:** physics and calibration of stellar distance indicators (Cepheids, RR Lyræ); stellar mass loss processes; physics and observation of extrasolar planetary systems and debris disks.
- **Observational Techniques:** ground and space based infrared astronomy; high contrast imaging.

EMPLOYMENT

July 2018 - Professor, Department of Physics and Astronomy, Iowa State University
2013 - 2018 Associate Professor, Department of Physics and Astronomy, Iowa State University
2009 - 2013 Assistant Professor, Department of Physics and Astronomy, Iowa State University
2003 - 2009 Astrophysicist at the Harvard-Smithsonian Center for Astrophysics,
Optical and Infrared Division, Spitzer/IRAC Instrument Team
2000 - 2003 Postdoctoral Research Associate at the Harvard-Smithsonian Center
for Astrophysics, High Energy Division w/ M. Karovska and D. Sasselov
1997 - 2000 Smithsonian Predoctoral Fellow at the Harvard-Smithsonian Center
for Astrophysics, Optical and Infrared Division, w/ Giovanni Fazio
1996 - 1997 Astrophysics Sector Computer System Administrator, SISSA/ISAS, Italy

EDUCATION

Jun 2000 Ph.D. in Astrophysics, Int. School for Advanced Studies (SISSA/ISAS), Trieste, Italy
Advisers: Prof. Dennis. W. Sciama, Dr. Giovanni G. Fazio and Prof. John C. Miller
Dissertation: *Mid-IR Observations and Modeling of Astrophysical Dust*
Nov 1993 Laurea cum Laude (M. Sc.) in Physics, Univ. of Torino, Italy
Advisers: Prof. Giovanni Silvestro and Prof. Maurizio Busso
Dissertation: *Imaging and Photometry of AGB Circumstellar Envelopes
with the mid-IR camera TIRCAM*
Jul 1987 Technical Degree in Computer Science, Inst. A. Avogadro, Torino, Italy

AWARDS

2015 Iowa State University Award for Mid-Career Achievement in Research
2004 NASA Group Achievement Award for the Spitzer Space Telescope Payload Team
2003 Smithsonian Institution Certificate of Award for Spitzer/IRAC support
2001 American Astronomical Society Small Research Grant
1997 - 2000 Smithsonian Institution Predoctoral Fellowship
1994 - 1997 Int. School for Advanced Studies (SISSA/ISAS), full Graduate Fellowship
1987 - 1988 Scuola Normale Superiore (SNS) of Pisa (Italy), full Undergraduate Fellowship

RESEARCH PROGRAM AND FUNDING

My research focuses on the study of stellar astrophysics and its applications to cosmology (stellar distance indicators) and to the origin of planetary systems. My program is supported by NASA and NSF and based on competitively awarded observing time I obtained at large space-based facility such as NASA's Spitzer Space telescope, Hubble Space telescope and NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA), and ground-based telescopes such as NASA's Infrared Telescope Facility, National Optical Astronomy Observatory (NOAO), National Radio Astronomy Observatory (NRAO) and European Southern Observatory (ESO) facilities.

The main effort of my research group is currently directed to establish an independent determination of the cosmological distance scale using RR Lyrae variable stars in Globular Clusters, the Halo and the Bulge of our Galaxy. Based on our observations of RR Lyrae at visible and infrared wavelengths we have developed a method, using Period-Luminosity and Period-Wesenheit relations, providing high precision (1-2%) distances for these stars and their environments. The accuracy of this method will allow us to resolve the tension existing in the measurement of cosmological parameters (including the Hubble constant H_0) between current stellar distance indicators (Cepheids and Supernovae Type Ia) and methods based on Cosmic Microwave Background radiation and Barionic Oscillations, which can be attributed to missing physics in the current Λ CDM cosmology. The RR Lyrae-based distance scale we are developing will be particularly suited for the new generation of observing facilities entering on-line by the end of the decade, including NASA's James Webb Space Telescope (JWST) and Wide Field InfraRed Telescope (WFIRST), and the NSF-funded Large Synoptic Survey Telescope (LSST).

I am also interested in the physics of the circumstellar environment, including the study of mass loss in advanced stages of stellar evolution, and the dynamics of young planetary systems. In particular my research focuses on the study of debris disks around systems like ϵ Eridani, η Corvi and the recently discovered KIC 8462852 system, currently undergoing the dramatic processes that happened in the Solar System at the time of its Late Heavy Bombardment (~ 3.8 billion years ago), that are responsible for delivering the water and other life-bearing volatiles to Earth.

PROFESSIONAL ASSOCIATIONS, COMMITTEES AND SERVICE

Since 2009	Research Associate, Smithsonian Astrophysical Observatory
Since 2006	Member of the International Astronomical Union
Since 2006	NSF AST and Mid-Scale Innovations in Astronomical Sciences Proposal Review
Since 2002	Referee for Astronomy & Astrophysics, The Astrophysical Journal, The Astronomical Journal, Monthly Notices of the Royal Astron. Soc.
Since 2001	NASA SOFIA, Spitzer Space Telescope, Postdoctoral Program, Hubble Space Telescope, Solar System Origins, NESSF, ADP and LTSA Proposal Reviewer
Since 2000	Member of the American Astronomical Society
2013 - 2015	Elected to the Astronomical Society Nominating Committee
2000 - 2009	Affiliate to the Harvard College Observatory

TEACHING

2014 -	Astro 342: Introduction to Solar Systems Astrophysics
2013 -	Astro 510: Graduate Astronomy Lab
2010 -	Astro 346: Introduction to Astrophysics
2010 - 2013	Astro 344L: Astronomy Lab

GRADUATE STUDENTS AND POSTDOCS

2013 - 2017 Jillian Neeley, Ph.D. student, Iowa State Univ. (now postdoc Florida Atlantic University)
2009 - 2016 Alan Huselbus: Ph.D. student, Iowa State University
2009 - 2013 Sarah Willis: Ph. D. student, Iowa State University (now at MIT Lincoln Labs)
2009 - 2011 Valsamo Antoniou: Postdoc, Iowa State University (now at Harvard-Smithsonian CfA)
2004 - 2008 Michael Schuster: SAO Predoctoral Fellow (now at MIT Lincoln Labs)

UNDERGRADUATE RESEARCH STUDENTS

2017 - Miles Lucas: Iowa State University
2015 - 2016 Nicolas Trueba: Iowa State University (now Ph.D. student University of Michigan)
2013 - 2014 Elizabeth Polsdofer: Iowa State University (now Ph.D. student, U Texas - Southwestern)
2013 Mikaela Leners: Iowa State University (now U.S. Dept. of the Interior, Park Ranger)
2012 - 2013 Jacob Smith: Iowa State University
2010 - 2013 Rebecca Park: Iowa State University
2010 - 2012 Samantha Glick: Iowa State University (now Science Museum of Minnesota)
2010 - 2011 Denise Wood: Iowa State University
2010 - 2011 Justin Spilker: Iowa State University (now Post. Fellow, U. of Texas, Austin)
2010 Peter Dimpfl: Iowa State University
2010 Kimberly Booe: Iowa State University
2009 Derek Huelsman: SAO REU student (M.S. Stanford U, now Data Analyst, Addepar)
2007 Megan Reiter: SAO REU student (now postdoctoral fellow, U of Michigan)
2005 Sarah Sonnett: SAO REU student (now Planetary Science Institute)
2004 Linda Watson: SAO REU student (now postdoctoral fellow, ESO)

SELECTED PUBLIC TALKS AND PRESS RELEASES

1. **Mysterious Dimming of Tabby's Star May be Caused by Dust**, NASA/ISU Rel., 10/2017
2. **SOFIA Confirms Nearby Planetary System Similar to Our Own**, NASA/ISU Rel., 5/2017
3. **Interview for the program "Cosmic Front", National Television of Japan, NHK**, 4/2016
4. **Strange Star Likely Swarmed by Comets**, NASA/ISU Press Release, 12/2015
5. **NGC 6334: A Mini Starburst Region?**, NOAO/CfA/AAS Press Conference, 6/2013
6. **"Cepheid Variables" Podcast of the series "Radio Stars"**, MIT Haystack Observatory, 2013
7. **Featured article on "Tähdet ja avarus"**, popular astronomy magazine in Finland, 4/2011 issue
8. **Live Interview for Radio Program "Soundings"**, KVMR-FM, Nevada City, CA, 1/2011
9. **Cosmology Standard Candles Not So Standard After All**, NASA/AAS Press Conf., 1/2011
10. **Pulverized Planet Dust May Lie Around Double Stars**, NASA Press Release, 8/2010
11. **Solar System's Young Twin Has Two Asteroid Belts**, NASA/CfA Press Release, 10/2008

SELECTED RECENT INVITED TALKS AND COLLOQUIA

1. **How to do PSF-Fitting Photometry with JWST**, SAGE Meeting, Keele Univ., UK, May 31, 2017
2. **Cepheids and RR Lyræ with Spitzer**, International Science Institute Beijing, China, May 24, 2016
3. **Sizing-Up the Cosmos with the Help of Variable Stars:**
 - Dept. of Physics Colloquium, University of Cincinnati, November 19, 2015
 - Dept. of Physics and Astronomy Seminar, University of North Carolina, October 27, 2015
4. **Mass Loss and Variability in Evolved Stars**, in Symposium "Why Galaxies Like AGB Stars III", Vienna, Austria, July 28, 2014

5. **Exo-Planetary Phoenix: Rebirth of Planetary Systems Beyond the Main Sequence**, Space Telescope Science Institute Spring Symposium Baltimore, MD, April 30, 2014
6. **Mass Loss in Advanced Evolutionary Phases**, Symposium “Stellar Population 55 Years After the Vatican Conference”, Rome, Italy, July 3-4, 2012
7. **Mass Loss in Cepheids: Observational Evidence from IR and Radio Data**, 220th American Astronomical Society Meeting special session on “Polaris: Mysteries of the North Star”, June 14, 2012
8. **Blowing a Standard Candle: the Disappearing Mass of δ Cephei**:
 - Kavli Institute for the Physics and Mathematics of the Universe, Tokyo, Japan, May 28, 2012
 - Physics Department Colloquium, University of Missouri Kansas City, February 3, 2012
 - Astronomy Colloquium, University of Minnesota, October 3, 2011

SELECTED REFEREED PAPERS

1. **On a New Theoretical Framework for RR Lyrae. II. Mid-IR Period-Luminosity-Metallicity Relations**, Neeley, J. R., Marengo, M., Bono, G. et al. 2017, *The Astrophysical Journal*, 841, 84
2. **On the RR Lyrae in Globular Clusters. IV ω Centauri Optical *UBVRI* Photometry**, Braga, V. F. et al. 2016, *The Astronomical Journal*, 152, 170
3. **IRTF/SPEX Observations of the Unusual Kepler Lightcurve System KIC 8462852**, Lisse, K. C., Sitko, M. L., Marengo, M. 2015, *The Astrophysical Journal Letters*, 815, 27
4. **KIC 8462852: The Infrared Flux**, Marengo, M., Hulsebus, A., Willis, S. 2015, *The Astrophysical Journal Letters*, 814, L15
5. **On the Distance of the Globular Cluster M4 Using RR Lyrae Stars. II. Mid-IR Period Luminosity Relations**, Neeley, J. R., Marengo M. et al. 2015, *The Astrophysical Journal*, 808, 11
6. **A Spitzer/IRAC Characterization of Galactic AGB and RSG Stars**, Reiter, M., Marengo, M., Hora, J. L. and Fazio, G. G. 2015, *Monthly Notices of the Royal Astronomical Society*, 447, 3909
7. **New Evidence for Mass Loss from δ Cephei from HI 21 cm Line Observations**, Matthews, L. D., Marengo, M., Evans, N. R., Bono, G. 2012, *The Astrophysical Journal*, 744, 53
8. **An Infrared Nebula Associated to δ Cephei: Evidence of Mass Loss?**, Marengo, M. et al. 2010, *The Astrophysical Journal*, 725, 2392
9. **Galactic Cepheids with Spitzer: I. Leavitt Law and Colors**, Marengo, M. et al. 2009, *The Astrophysical Journal*, 709, 120
10. **Spitzer/IRAC Limits to Planetary Companions of Fomalhaut and ϵ Eridani**, Marengo, M. et al. 2009, *The Astrophysical Journal*, *The Astrophysical Journal*, 700, 1647
11. **Imaging the Cool Hypergiant NML Cygni’s Dusty Circumstellar Envelope with Adaptive Optics**, Schuster, M., Marengo, M. et al. 2009, *The Astrophysical Journal*, 699, 1423
12. **ϵ Eridani’s Planetary Debris Disk: Structure and Dynamics Based on Spitzer and Caltech Submillimeter Observatory Observations**, Backman, D., Marengo, M. et al. 2009, *The Astrophysical Journal*, 690, 1522
13. **Discovery of Two T Dwarf Companions with the Spitzer Space Telescope**, Luhman, K. L., Patten, B. M., Marengo, M. et al. 2007, *The Astrophysical Journal*, 654, 570
14. **The Infrared Array Camera (IRAC) for the Spitzer Space Telescope**, Fazio, G. G. et al. 2004, *Astrophysical Journal Supplement*, 154, 10
15. **Smoking Quasars: A New Source for Cosmic Dust**, Elvis, M., Marengo, M., Karovska, M. 2002, *Astrophysical Journal Letters* 567, L107
16. **Theoretical Limb Darkening for Pulsating Cepheids**, Marengo, M., Sasselov, D. D., Karovska, M., Pappalios, C., Armstrong, J. T. 2002, *The Astrophysical Journal* 567, 1131

NASA/ADS *h*-index 34; the complete list of publications (over 100 refereed papers and 200 contributed papers and abstracts) is available at <http://mmarengo.physics.iastate.edu>