

# Maria A. Tiongco

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CU Boulder JILA Institute  $\diamond$  440 UCB  $\diamond$  Boulder, CO 80309

## RESEARCH INTERESTS

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- Stellar dynamics
- Dynamical evolution of globular clusters
- $N$ -body simulations
- Internal kinematics of stellar systems

## EDUCATION

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**Indiana University, Bloomington** 2018

**Ph.D.**, Astronomy

Title: *Kinematical Evolution of Tidally Limited Star Clusters*

Advisor: Enrico Vesperini

Minor: Scientific Computing

**University of Michigan, Ann Arbor** 2010

**B.S.**, Astronomy & Astrophysics

**B.S.**, Interdisciplinary Physics

## POSITIONS

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**Postdoctoral Associate** August 2019–Present  
*University of Colorado*

**Postdoctoral Fellow** August 2018–May 2019  
*Indiana University*

**IU President’s Diversity Dissertation Fellow** 2017–2018  
*Indiana University*

## HONORS AND AWARDS

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Galaxies Journal Travel Award	2019
Hollis and Grete Johnson Research Prize	2018
AAS Rodger Doxsey Travel Prize Honorable Mention	2017
IU President’s Diversity Dissertation Fellowship	2017
Joseph & Frances Morgan Swain Graduate Fellowship	2016
AAS Division on Dynamical Astronomy Raynor L. Duncombe Prize	2016
IU College of Arts and Sciences Matias L. Ochoada Fellowship	2016
AAS International Travel Grant	2015, 2016
IU College of Arts and Sciences Travel Award	2013, 2017
IU Provost Travel Award for Women in Science	2013, 2015–2018

## RESEARCH EXPERIENCE

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<b>Indiana University</b> <i>Research Assistant, Advisor: Enrico Vesperini</i>	2012–2018
<b>University of Chicago</b> <i>REU Student, Advisor: Stephan Meyer</i>	2009
<b>University of Michigan</b> <i>Research Assistant, Advisor: John Monnier</i>	2008
<b>Baylor University</b> <i>REU Student, Advisor: Dwight Russell</i>	2008

## TELESCOPE TIME AWARDED

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<b>Harlan J. Smith 2.7m Telescope (21 hours)</b> <i>Co-I, PI: Maximilian Fabricius</i>	2017 <i>McDonald Observatory</i>
<ul style="list-style-type: none"><li>· Proposal Title: “Maximum Rotational Velocity of Milky Way Globular Clusters”</li><li>· Using the VIRUS-W Integral Field Unit Spectrograph to locate the peak of the internal rotational velocity profile of a few bright northern globular clusters</li></ul>	
<b>Very Large Telescope (2 hours)</b> <i>Co-I, PI: Emanuele Dalesandro</i>	2019 <i>European Southern Observatory</i>
<ul style="list-style-type: none"><li>· Proposal Title: “A rapidly rotating core in the low mass globular cluster NGC6362?”</li><li>· Using the MUSE Integral Field Unit Spectrograph to obtain the rotational velocity of the central regions of the globular cluster NGC6362</li></ul>	

## TEACHING EXPERIENCE

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<b>Indiana University</b> <i>Instructor</i>	2013
<ul style="list-style-type: none"><li>· Astronomy 100 - The Solar System</li><li>· Introductory astronomy course for non-science majors. Topics covered: the celestial sphere, seasons, moon phases, eclipses, history of astronomy, gravity, telescopes, properties of light and atoms, theory of solar system formation, the Solar System and its constituents: Sun, planets, moons, asteroids, and comets.</li></ul>	
<b>Indiana University</b> <i>Associate Instructor</i>	2012–2015
<ul style="list-style-type: none"><li>· Astronomy 103 - Search for Life in the Universe</li><li>· Astronomy 105 - Stars and Galaxies</li><li>· Astronomy 451 - Stellar Astrophysics</li><li>· Astronomy 450 - Galactic Astrophysics</li><li>· Responsibilities included guest lecturing, holding office hours, grading, running rooftop and solar lab observing sessions</li></ul>	

## PROFESSIONAL TALKS AND POSTERS

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- International Astronomical Union (IAU) Symposium 351 - “Star Clusters: from the Milky Way to the Early Universe” & MODEST-19 (see below)** May 2019  
*University of Bologna* *Bologna, Italy*
- Contributed Talk: “Kinematical Evolution of Globular Clusters”
- Science With Precision Astrometry Workshop** March 2018  
*Space Telescope Science Institute* *Baltimore, MD*
- Contributed Talk: “Evolution of the Internal Kinematics of Globular Clusters”
- 231st American Astronomical Society Meeting** January 2018  
*Washington, DC*
- Dissertation Oral Presentation: “Effects of Dynamical Evolution on Globular Clusters Internal Kinematics”
- MODEST-17 (Modelling and Observing Dense Stellar Systems)** September 2017  
*Charles University* *Prague, Czech Republic*
- Contributed Talk: “Dynamical evolution of tidally limited rotating star clusters”
- The exciting lives of galactic nuclei** March 2017  
*Max Planck Institute for Astronomy* *Tegernsee, Germany*
- Invited Talk: “Kinematics of multiple stellar population clusters (and their tantalizing cores)”
- AAS Division on Dynamical Astronomy 2016 Meeting** May 2016  
*Vanderbilt University* *Nashville, TN*
- Duncombe Prize Talk: “Effects of dynamical evolution on the internal kinematical properties of star clusters”
- Star Clusters as Cosmic Laboratories for Astrophysics, Dynamics and Fundamental Physics/MODEST-16** April 2016  
*University of Bologna* *Bologna, Italy*
- Contributed Talk: “Dynamical evolutionary effects on star cluster kinematics”
- MODEST-15 (Modelling and Observing Dense Stellar Systems)** March 2015  
*University of Concepción* *Concepción, Chile*
- Poster Presentation: “Lifetimes and kinematics of rotating star clusters in a tidal field”
- 222nd American Astronomical Society Meeting** June 2013  
*Indianapolis, IN*
- Poster Presentation: “Early Evolution of Rotating Star Clusters - Homogeneous Initial Conditions”

## PUBLIC OUTREACH

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- **Public observing nights at Kirkwood Observatory at IU:** showing the public astronomical objects through the 12-inch diameter Kirkwood refractor telescope
- **Science Fest/Physics and Astronomy Open House at IU:** running astronomy-related demos/activities for the public
- **Indiana Science Olympiad Astronomy Division:** drafting, proctoring, and grading exams
- **Founding writer and editor** for *SciIU: Conversations in Science @ Indiana University*, a science blog written for undergraduates at IU (<http://www.blogs.iu.edu/sciu>)

## PROFESSIONAL MEMBERSHIPS

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American Astronomical Society  
AAS Division on Dynamical Astronomy

## PROFESSIONAL SERVICES

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- **Session chair** for MODEST-17 Meeting
- **Referee** for Monthly Notices of the Royal Astronomical Society

## WORKSHOPS

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<b>International Gaia School</b>	November 2013
<i>National Autonomous University of Mexico</i>	<i>Mexico City, Mexico</i>
· School Title: “Galactic Dynamics in the Times of Gaia and other Great Surveys”	

## TECHNICAL SKILLS

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<b>Astronomy &amp; Astrophysics Codes</b>	NBODY6, Starlab, GADGET-2
<b>Analysis Software</b>	R, MATLAB, Mathematica, IDL
<b>Programming Languages</b>	Fortran, Python
<b>Other Tools</b>	L <sup>A</sup> T <sub>E</sub> X, Linux/Unix Shell Scripting, HTML

## REFEREED PUBLICATIONS

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8. **M. Tiongco**, E. Vesperini, and A. L. Varri, *Kinematical evolution of multiple stellar populations in star clusters*, 2019, MNRAS, 487, 5535
7. B. Lanzoni, F. R. Ferraro, A. Mucciarelli, C. Pallanca, **M. Tiongco**, and 9 co-authors, *The ESO Multi-Instrument Kinematic Survey (MIKiS) of Galactic Globular Clusters: solid body rotation and anomalous velocity dispersion profile in NGC 5986* 2018, ApJ, 865, 11
6. B. Lanzoni, F. R. Ferraro, A. Mucciarelli, **and 10 co-authors**, *The strong rotation of M5 (NGC 5904) as seen from the MIKiS Survey of Galactic Globular Clusters* 2018, ApJ, 861, 16
5. **M. Tiongco**, E. Vesperini, and A. L. Varri, *The complex kinematics of rotating star clusters in a tidal field*, 2018, MNRAS 475, L86
4. **M. Tiongco**, E. Vesperini, and A. L. Varri, *Kinematical evolution of tidally limited star clusters: rotational properties*, 2017, MNRAS, 469, 683
3. O. Boberg, E. Vesperini, E. Friel, **M. Tiongco**, and A. L. Varri, *Internal Rotation in the Globular Cluster M53*, 2017, ApJ, 814, 114
2. **M. Tiongco**, E. Vesperini, and A. L. Varri, *Kinematical evolution of tidally limited star clusters: the role of retrograde stellar orbits*, 2016, MNRAS, 461, 402
1. **M. Tiongco**, E. Vesperini, and A. L. Varri, *Velocity anisotropy in tidally limited star clusters*, 2016, MNRAS, 455, 3693