Matthias J. Raives

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Research Objectives

To study open problems in theoretical and computational astrophysics. I have particular interest in the supernova explosion mechanism and the winds of newly born, highly magnetic neutron stars.

Education

The Ohio State University • 2015 - Present • Columbus, OH
PhD in Astronomy • Advisor: Professor Todd Thompson • expected June 2021
MS in Astronomy • 2018

California Institute of Technology • 2011 - 2015 • Pasadena, CA
BS in Astrophysics

Honors

Dean's Distinguished University Fellowship
The Ohio State University • 2015 - 2016 and 2020 - 2021

Selected Publications

Magnetized Rotating Isothermal Winds of Proto-Neutron Stars
Matthias J. Raives, Matthew S. B. Coleman, Todd A. Thompson
To Be Submitted 2020

The Antesonic Condition for the Explosion of Core-Collapse Supernovae II: Rotation and Turbulence
Matthias J. Raives, Todd A Thompson, Sean M. Couch
2020, MNRAS (submitted), arxiv:2009.04478

The Antesonic Condition for the Explosion of Core-Collapse Supernovae I: Spherically Symmetric Polytropic Models: Stability & Wind Emergence
Matthias J. Raives, Sean M. Couch, Johnny P. Greco, Ondrej Pejcha, Todd A. Thompson
2018, MNRAS, Volume 481, p. 3293-3304

Accurate, Meshless Methods for Magnetohydrodynamics
Phillip F. Hopkins, **Matthias J. Raives**
2016, MNRAS, Volume 455, p. 51-88

Contributed Talks

The Antesonic Condition: Understanding the Critical Explosion Criterion
Midwest Workshop on Supernovae and Transients • The Ohio State University • September 2019

The Antesonic Condition for Core-Collapse Supernovae
Midwest Workshop on Supernovae and Transients • University of Chicago • February 2019

Teaching Experience

Graduate TA
Astronomy 1101, 1102, 1140, 1141, 1142 • The Ohio State University • 2016 - 2018

Head TA
The Ohio State University • 2017 - 2018

Skills

Programming Languages
Python • Mathematica • C/C++

Simulation Software
Athena++ • FLASH