Curriculum Vitae

Chamani M. Gunasekera

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RESEARCH INTERESTS

Theoretical Astrophysics, Astrophysical Data Analysis and Astrophysical Modelling. In particular, understanding selective element depletion in the interstellar matter (ISM) of emission-line galaxies, studying photoionization model predictions and improving Cloudy (a spectral synthesis software that simulates conditions in the ISM).

EDUCATION

University of Kentucky (UK), Lexington, KY USA
PhD Candidate (Post-Qualified), Physics & Astronomy, expected graduation 2023
Masters, Physics & Astronomy, December 2021
Advisors: Gary Ferland, Marios Chatzikos & Renbin Yan

College of Saint Benedict & Saint John's University (CSB/SJU), St Joseph, MN, USA
BA, Physics & Mathematics, May 2017
Advisors: Jim Crumley

RESEARCH EXPERIENCE

Graduate Research Assistantship, UK, Summer 2021 - Spring 2022
Project: Processing Chianti Database version 10.0.1, to be compatible with Cloudy.
Advisors: Gary Ferland & Marios Chatzikos

Graduate Research Assistantship, UK, Fall 2020 – Fall 2021
Project: Understanding the discrepancy in the [O I] emission line intensity between MaNGA data and photoionization models. This project lead to the study of selective element depletions onto dust particles in the atmosphere of interstellar matter (particularly H II regions), and incorporating new post-depletion abundance calculations into CLOUDY.
Advisors: Gary Ferland, Marios Chatzikos & Renbin Yan

Graduate Research Assistantship, UK, Spring 2019 - Fall 2020
Project Title: Analyzing source of Blazhko effect in RR Lyrae type variable stars. I utilized the MacAdam Observatory to obtain observations of Ru Pisces. This data was then processed and analyzed to look for period of pulsations, and any irregularities.
Advisor: Ronald Wilhelm

Summer Research for Undergraduates, CSB/SJU, Summer 2016 - Fall 2017
Project Title: Finding notable characteristics of solitary waves near Polar-Magnetopause crossing, using Polar, OMNI, ACE, and WIND satellite observations.
Advisor: Jim Crumley

TEACHING EXPERIENCE

Graduate Teaching Assistant, Department of Physics & Astronomy, UK, Spring 2018 - Spring 2020
Responsibilities as Lab Teaching Assistant: instructing students through lab exercises and evaluating student work.
Responsibilities as Recitation Teaching Assistant: helping students understand material presented in lecture, holding office hours, and evaluating student work.

Summer Graduate Course Assistant, Department of Physics & Astronomy, UK, Summer 2019
Responsibilities as Lab Teaching Assistant: instructing students through lab exercises and evaluating student work.
Responsibilities as Recitation Teaching Assistant: helping students understand material presented in lecture, holding office hours, and evaluating student work.

Undergraduate Teaching Assistant, Department of Mathematics, CSB/SJU, Fall 2015 - Spring 2017
Responsibilities as Teaching Assistant: Evaluating student work and tutoring students at the Mathematics resource center.

RESEARCH PUBLICATIONS

3. *"Ingesting a fluid atomic database: Adopting CHIANTI v10.0.1 into CLOUDY"*
Gunasekera, C. M., Chatzikos, M., Yan, R., Ferland, G., 2022. (In Review at Atoms Journal)

2. *"Self consistent grain depletions and abundances II: Effects on strong-line diagnostics of extragalactic H II regions"*
Gunasekera, C. M, Ji, X., Chatzikos, M., Yan, R., Ferland, G., 2022. (In Review at MNRAS Journal)

1. *"Self-consistent grain depletions and abundances I: The Orion Nebula as a test case"*
Gunasekera, C. M, Ji, X., Chatzikos, M., Yan, R., Ferland, G., 2022, Monthly Notices of the Royal Astronomical Society. doi:10.1093/mnras/stac022

RESEARCH TALKS & POSTER PRESENTATION

June 2022 - 240th American Astronomical Society Meeting
April 2022 - Astronomy Seminar, UK
April 2021 - Astronomy Seminar, UK
August 2014 - Summer Research for Undergraduates, CSB/SJU

GRANTS RECEIVED

Spring 2021 - Spring 2023: NASA grant 19-ATP19-0188
Summer 2020 - Fall 2020: STScI (HST-AR-15018 and HST-GO-16196.003-A)

COMPUTER SKILLS

Languages: C++, Python, IDL, LaTeX.
Applications: Vi/Vim, Git, Spyder, Jupyter
Operating Systems: Unix, Linux, Mac OSX, Windows.

ADDITIONAL SKILLS

Extensive experience in data reduction and visualization of massive simulation outputs.
Extensive experience in parallel computing.
Extensive experience operating ground based telescope.

OTHER

Nominee for MacAdam Graduate Excellence Fellowship in Physics & Astronomy 2022, UK