

Curriculum Vitae

Azmain H. Nisak

Graduate Student of Physics and Astronomy

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EDUCATION

Georgia State University

Master of Science Candidate in Physics: January 2021

GPA: 3.9

Doctor of Philosophy Candidate in Astronomy: April 2022

City College of the City University of New York

Bachelor of Science Candidate in Physics: May 2017

GPA: 3.8

HONORS

Provost Dissertation Fellowship, July 2021-April 2022

Outstanding Second Year Graduate Student - 2020

Macauley Honors Scholarship, 2013-2017

Dean's List, Spring 2014 and Spring 2015 Term

National Society for Leadership and Success, January 2015-Present

Golden Key International Honour Society, March 2015-Present

City College Fellowship, May 2015-May 2017

RESEARCH INTERESTS

Planet Formation

Exoplanets

Open Clusters

Planet Migration

Stellar jitter

Spectral Synthesis & Modeling

Young Stars

Planet Detection

Stellar Structure & Evolution

RESEARCH EXPERIENCE

Georgia State University

Atlanta, GA

08/17-Present

Graduate Student (Advisor: Dr. Russel White)

- Programming languages learned: Python, IDL, Fortran, Julia, Latex
- Refined single-star main sequences for nearby open clusters using GAIA and TESS
- Improved age estimates for nearby open clusters using main-sequence fitting and lithium depletion
- Developed Python code to model and automate line strength measurements
- Developed Python code to automate radial and rotational velocity measurements
- Developed Python code to measure line bisectors
- Modeled spectra using IRAF, Python, and Spectroscopy Made Easy
- Derived stellar properties from spectra using Empirical SpecMatch
- Spectroscopically confirmed new photometric cluster candidates using CHIRON and GOODMAN
- Monitored Sun-like cluster stars to identify candidate planets and measure stellar jitter; used IDL code rvfit to help characterize trends in RVs
- Traveled and trained to use CHIRON and GOODMAN on-site

CUNY City College of New York

New York, NY

11/14-05/17

Undergraduate Physics Research Intern (Advisor: Dr. Swapan Gayen)

- Programming languages learned: MATLAB, C++, Arduino (Programming in C), and Python
- Characterized the spectroscopic properties of impurity ion-doped insulators using lasers
- Measured absorption, polarization-dependent absorption, fluorescence, fluorescence lifetime, and electronic Raman scattering spectra
- Discovered 13 energy-level transitions, previously unverified by experiment, and was the first to report on optical spectroscopic properties of 2 new laser crystals (Honors Research Report; unpublished)

SCHOLARLY WORKS

Research Presentations

- City College Academy for Professional Preparation (CCAPP) 2015 Annual Poster

Presentation: "Optical Spectroscopic Properties of Pr³⁺: La₂Be₂O₅"

- 2017 City College of New York (CCNY) Fellowship Conference: “Fluorescence Spectra and Fluorescence Lifetime of Pr: BEL”
- May 2017 Honors Research Conference Presentation: “Optical Spectroscopy of Impurity Ion-Doped Insulators (Ce³⁺: YAlO₃)”
- January 2019 American Astronomical Society (AAS) Meeting Poster: “Lithium Depletion and Stellar Jitter in Young Open Clusters”
- March 2019 Research Presentation for Qualifying Exam: “Using Nearby Open Clusters to Constrain Stellar Evolution and Giant Planet Migration Theories”
- July 2020 Research Presentation for Prospectus Talk: “The Southern Hemisphere Open Cluster (SHOC) Survey: Detection Limits & New Planets at Young Ages”
- January 2021 AAS Meeting Oral Presentation: “Confirming New Suns and Searching for New Planets in IC 2602 and IC 2391”

Publications

- “Mapping out the Stellar Populations of IC 2602 and IC 2391”, Nisak, A. H., White, R. J., Yep, A., Henry, T. J., Paredes, L., James, H., Jao, W. (Submitted to ApJ)
- “Candidate Hot Jupiters and Stellar Jitter in the 43-52 Myr old stellar associations IC 2602, IC 2391, and Tucana-Horologium”, Nisak, A. H., White, R. J., Yep, A., Henry, T. J., Paredes, L., James, H., Jao, W. (in prep., 2021)

NOAO PROPOSALS

2019A-0271 *CTIO 1.5-m telescope* **CHIRON**
 - Awarded 42 hours: Pilot survey to measure the stellar jitter of 12 slowly rotating Sun-like stars in young, nearby open clusters IC 2602 and IC 2391. Planet detection prospects are promising so far.

2019B-0401 *SOAR 4.1-m telescope* **GOODMAN**
 - Awarded 30 hours: Confirmed new cluster candidate members discovered in IC 2602 and IC 2391 down to spectral type M3. Thus far, all FGK members confirmed via youth signatures.

2020A-0351 *CTIO 1.5-m telescope* **CHIRON**
 - Awarded 54 hours: 13 new IC 2602 and IC 2391 stars were monitored and the 12 from 2019A-0271 were revisited. Data analysis in progress.

TEACHING, OUTREACH, & SERVICE

Teaching

- Have taught 18 labs (~25 students/lab): 17 in introductory astronomy and 1 in calculus-based physics on electricity and magnetism.
- Tutored 7th and 8th grade students on SHSAT-level mathematics (at middle school I.S. 217 in Queens, NY on 01/2013-08/2013). Also graded and proof-read tests administered by the math teachers.

Outreach

- Volunteered at 4 Open House Public Nights at the Hard Labor Creek Observatory (HLCO): Operated 24-in. telescope and shared knowledge of astronomy.
- Volunteered at 2018 Science Olympiad: Created astronomy questions and oversaw the competition.
- Ran 6 public on-campus observing sessions at Georgia State University (GSU): Operated telescopes and shared astronomy knowledge.
- Operated astronomy game show at Wolf Creek Elementary School and gave astronomy presentation on Mars at Jean Child’s Young Middle School as part of the Georgia Outreach Team for Space (GOT Space) program to spread astronomy knowledge to elementary and middle school students.

Service

- Trained and guided 3 new members of my undergraduate physics research group with their projects.
- Have aided the CHIRON team by building a catalogue of spectral standards for public use
- Took over part-time scheduling responsibilities for CHIRON on the 1.5-m telescope since Fall 2019 (have scheduled over 120 nights so far)