Amy Fare

Data | Computing | Education

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EDUCATION

Western University, London *September 2018 - April 2020*
Master of Science, Astronomy

McMaster University, Hamilton *September 2014 - April 2018*
Bachelor of Integrated Science
Minor in Physics

RESEARCH EXPERIENCE

Research Assistant, Dept. of Physics & Astronomy, Dr. Els Peeters *May 2017 - April 2020*
Western University, London, ON
I investigated the grandPAH hypothesis - the notion that interstellar PAH populations are made up of a small number of dominant, robust PAH species - in reflection nebulae and HII regions. I developed and applied a quantitative measure for PAH preference in observed emission spectra, and tested the degeneracy of PAH spectra fit to the emission observed in several interstellar objects. I am expecting to publish my results as a refereed paper.

Honours thesis, Dept. of Physics & Astronomy, Dr. Alison Sills *January 2017 - April 2018*
McMaster University, Hamilton, ON
I developed and studied simulations of globular clusters with helium-rich populations. I constructed a semi-analytic formula for the main-sequence lifetime of helium-rich stars, and conducted N-body simulations of globular clusters with helium-rich secondary populations to investigate how their presence impacts globular cluster dynamics.

Research Assistant, Dept. of Physics & Astronomy, Dr. Doug Welch *May - August 2015, 2016*
McMaster University, Hamilton, ON
Using visual observations from AAVSOnet telescopes, I constructed a more complete and accurate set of finder charts for monitoring of variable stars in globular clusters by advanced amateur astronomers. I reduced, analyzed, and visualized photometric data, and documented the methods and data products I developed.

OTHER WORK EXPERIENCE

Numerade
Educator *March 2020 - Present*
Created whiteboard–style videos explaining material from high school and university Physics courses.

Freelance
Private Tutor *September 2018 - Present*
Provided one–on–one Math & Physics tutoring for courses at elementary school to university levels.

Western University
Graduate Teaching Assistant - tutorial *September 2019 - April 2020*
Led tutorials for undergraduate first-year Physics courses offered at Western University, as well as the Integrated Science program, and graded exams and other assignments.

Graduate Teaching Assistant - laboratory *September 2018 - April 2019*
Led laboratory sessions for undergraduate first-year Physics courses offered at Western University.

McMaster University
MIIETL Student Scholar *2015 - 2016*
Designed an interactive undergraduate course centred around planetarium use by students, and tested the effectiveness of planetariums as supplements to traditional lectures.

PUBLICATIONS

Fare, A., Webb, J.J. and Sills, A., 2018. The effect of stellar helium abundance on dynamics of multiple populations in globular clusters. *Monthly Notices of the Royal Astronomical Society*, 481(3), pp.3027-3032.

CONFERENCES & PRESENTATIONS

Canadian Undergraduate Physics Conference (CUPC) *October 2017*
Presented work on grandPAHs to an audience of undergraduate students and graduate judges from diverse physics disciplines.

American Association of Variable Star Observers (AAVSO) *November 2016*
Presented variable stars in globular clusters to an audience of professional and advanced amateur astronomers.

Canadian Undergraduate Physics Conference (CUPC) *October 2016*
Presented research on variable stars in globular clusters to an audience of undergraduate students and graduate judges from diverse physics disciplines.

International Planetarium Society Conference (IPS) *June 2016*
Presented pedagogical research on planetariums in higher education to an audience of planetarium/-museum directors, educators, and researchers.

McMaster Research in Teaching and Learning Conference *December 2015*
Presented pedagogical research on planetariums in higher education to an audience of pedagogical researchers.

SCHOLARSHIPS & AWARDS

Western University

NSERC USRA *April 2018*
Undergraduate Pre-thesis Award *April 2017*
(Half of) sponsored trip to Ottawa for CUPC *October 2017*

McMaster University

(Half of) sponsored trip to Ottawa for CUPC *October 2017*
Sponsored trips to Boston, Halifax, and Warsaw for AAVSO, CUPC, and IPS *2016*
William McKeon Memorial Academic Grant in Physics *2015*
$1000 entrance scholarship *2014*

EXTRA-CIRRUCULAR

International Genetically Engineered Machine: McMaster Team *2016 - 2017*
As the head of the dry lab (programming team), I recruited and managed a team of programmers, doing computational biology research in coordination with the wet lab. We developed an agent-based model of quorum sensing in bacteria populations.

SKILLS & EXPERIENCE

Programming Python, C++, Lua, SQL, Perl, R, MATLAB, Java
Publishing LaTeX, HTML/CSS/Javascript
Working UNIX-like operating systems, ArcGIS