

# Amy Fare

Data | Computing | Education

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## EDUCATION

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**Western University, London**  
Master of Science, Astronomy

*September 2018 - April 2020*

**McMaster University, Hamilton**  
Bachelor of Integrated Science  
Minor in Physics

*September 2014 - April 2018*

## RESEARCH EXPERIENCE

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**Research Assistant**, Dept. of Physics & Astronomy, Dr. Els Peeters  
*Western University, London, ON*

*May 2017 - April 2020*

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  
*McMaster University, Hamilton, ON*

*January 2017 - April 2018*

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  
*McMaster University, Hamilton, ON*

*May - August 2015, 2016*

Using visual observations from AAVSO.net 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

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**Numerade**  
*Educator*

*March 2020 - Present*

Created whiteboard-style videos explaining material from high school and university Physics courses.

## **Freelance**

*Private Tutor*

*2016 - 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**

*MIETL 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**

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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**

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**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

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### 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-CIRRICULAR

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### 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

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### Programming

Python, C++, Lua, SQL, Perl, R, MATLAB, Java

### Publishing

L<sup>A</sup>T<sub>E</sub>X, HTML/CSS/Javascript

### Working

UNIX-like operating systems, ArcGIS