

CONTACT INFORMATION

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CURRENT POSITION

Northwestern University	2016 -
Graduate Student	
NSF Graduate Fellow	2018 -
Blue Waters Graduate Fellow	2018 - 2019
IDEAS Fellow	2017 - 2020

EDUCATION

Northwestern University	<i>exp.</i> 2023
Ph.D. Astronomy, Advisor: Claude André Faucher-Giguère	
Northwestern University	2018
M.S. Astronomy	
Carnegie Mellon University	2016
B.Sc. Physics, Astrophysics Track	
College & University Honors	

GRANTS / FELLOWSHIPS

- NSF Graduate Fellowship** 2018-
National Science Foundation Fellowship · recruits high-potential, early-career scientists and engineers and supports their graduate research for three years.
- Blue Waters Graduate Fellowship** 2018-2019
National Center for Supercomputing Applications Fellowship · provides PhD students with a year of support, an allocation of 50,000 node-hours on the powerful Blue Waters petascale computing system, and funds for travel to a Blue Waters Symposium to present research progress and results.
- IDEAS Fellowship** 2017-2020
National Science Foundation Traineeship/Fellowship · supports graduate students in data-enabled science and engineering by offering NSF level graduate funding for one year and access to a battery of interdisciplinary courses in statistics and machine learning. Fellows also receive funding for an internship in industry and the opportunity to contribute to the development of a citizen science project. For more information visit ideas.ciera.northwestern.edu.
- DSI Data Science Fellowship** 2016-2017
Northwestern University Fellowship · supports first year graduate students dedicated to the exploration of fundamental and applied advancement in data science as part of the university's Data Science Initiative (DSI). Up to 15 students are awarded this additional funding per year.
- NASA Illinois Space Grant Research Program** 2016
State Grant · supports undergraduate and incoming graduate students for a 10 week summer research session before the official start of classes. Up to 10 students are awarded this source of funding per year.

SKILLS & WORKSHOPS

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|----------|--------------|--------------|----------|
| • Python | • git | • d3.js | • CUDA |
| • C/C++ | • html + css | • three.js | • MPI |
| • bash | • javascript | • open/webGL | • openMP |

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5. **Mentoring Up · mentorship** 2021
TGS workshop on mentoring and how to make mentorship happen good from the perspective of a mentee. Based on research from U Wisc Mad
 4. **NVIDIA GTC · programming and optimizing CUDA applications** 2019
Week long conference in Silicon Valley focused on GPU applications in machine learning and AI with hands-on instructor led training sessions in programming and optimizing CUDA applications.
 3. **Ready, Set, Go! · oral science communication** 2017
10 week course, science communication and presentation skills, culminated in the development of a TED style lecture.
 2. **Scaling to Petascale Institute · massively parallel computing** 2017
weeklong high performance computing workshop, covered high level parallelism optimization as well as GPU computing, including sessions from NVIDIA staff.
 1. **San Diego Supercomputing Center Summer Institute · massively parallel computing** 2017
weeklong high performance computing workshop, covered parallelism with openMP/MPI, HPC with Python, topics in data science, and GPU computing.

COMPUTATIONAL RESOURCES ALLOCATED

2. **Quest** 35k NH
P.I. · Northwestern University
GPU accelerated interstellar chemistry with WIND, a (mostly) general stiff ODE solver
1. **Blue Waters** 50k NH
P.I. · National Center for Supercomputing Applications
GPU Accelerated Time-Dependent Chemistry in the Context of Galaxy Formation with WIND

SELECTED PUBLICATIONS

ADS Listing

4. Flores Velázquez, J. A., **Gurvich, A. B.**, Faucher-Giguère, C.-A., et al. 2021, [MNRAS](#), 501, 4812
3. **Gurvich, A. B.**, Faucher-Giguère, C.-A., Richings, A. J., et al. 2020, [MNRAS](#), 498, 3664
2. **Gurvich, A.**, Burkhardt, B., & Bird, S. 2017, [ApJ](#), 835, 175
1. **Gurvich, A.**, & Mandelbaum, R. 2016, [MNRAS](#), 457, 3522

SOFTWARE

3. **Gurvich, A. B.** 2022, FIRE Studio: Movie making utilities for the FIRE simulations, [Astrophysics Source Code Library](#), ascl:2202.006
2. Grudić, M., & **Gurvich, A. B.** 2021, [JOSS](#), 6, 3675
1. Geller, A. M., & **Gurvich, A. B.** 2018, Firefly: Interactive exploration of particle-based data, [Astrophysics Source Code Library](#), ascl:1810.021

POSTERS / PRESENTATIONS

12. **Virtual Ringberg Seminar Series** 2021
seminar - invited talk - Alex Gurvich
Rapid disk settling at the end of bursty star formation
11. **GALSPEC2021** 2021
conference - contributed talk - Alex Gurvich
Feedback regulated star formation in galaxies evolving from bursty clumps to time-steady disks

10. **Feedback 2019** 2019
conference - poster - Alex Gurvich, Claude-André Faucher-Giguère
Vertical Hydrostatic Balance in Galactic Disks from the FIRE Simulations
9. **Blue Waters Symposium** 2019
conference - poster & contributed talk - Alex Gurvich, Claude-André Faucher-Giguère
GPU accelerated interstellar chemistry with WIND, a (mostly) general stiff ODE solver
8. **Laws of Star Formation** 2018
conference - poster - Alex Gurvich, Claude-André Faucher-Giguère
Vertical Hydrostatic Balance in Galactic Disks from the FIRE Simulations
7. **Astroviz 2018** 2018
conference - contributed talk - Alex Gurvich, Aaron Geller
Firefly: A web-based particle viewer
6. **Northwestern University, Seven Minutes of Science** 2017
symposium - invited talk - Alex Gurvich
Exploring the Universe with Computer Simulations
5. **Northwestern University, Computational Research Day** 2017
symposium - poster - Alex Gurvich, Claude-André Faucher-Giguère
Studying Galactic Winds Using High-Resolution Numerical Simulations of Galaxy Evolution
4. **Northwestern University, Illinois Space Grant** 2016
symposium - invited talk - Alex Gurvich, Claude-André Faucher-Giguère
Regulated Star Formation in the FIRE Simulations
3. **Meeting # 227 of the American Astronomical Society** 2016
conference - poster - Alex Gurvich, Blakesley Burkhart, Simeon Bird
Magnetic Turbulence and Line Broadening in Simulations of Lyman-Alpha Absorption
2. **Carnegie Mellon University** 2015
symposium - poster - Alex Gurvich, Rachel Mandelbaum
The impact of correlated noise on galaxy shape estimation for weak lensing
1. **Harvard Center for Astrophysics** 2015
symposium - invited talk - Alex Gurvich, Blakesley Burkhart, Simeon Bird, Lars Hernquist
Magnetic Turbulence and Line Broadening in Simulations of Lyman-Alpha Absorption

AWARDS/HONORS

7. **Northwestern Science in Society Scientific Image Contest** 2018
Second Place Prize & People's Choice Award
6. **Laws of Star Formation Conference** 2018
Honorable Mention in Poster Competition
5. **Northwestern University, Computational Research Day** 2018
Animated Visualization Competition Grand Prize
4. **Phi Beta Kappa** 2016
National Honor Society
3. **Phi Kappa Phi** 2016
National Honor Society
2. **Andrew Carnegie Society** 2015
University Service & Honor Society
1. **Dean's List High Honors** 2012-2016
Carnegie Mellon University

TEACHING EXPERIENCE

STUDENTS MENTORED

4. Maggie Kraft - Lane Technical High School Chicago, IL - Interviewed researchers of Zooniverse citizen science projects and produced written summaries for the annual "Into the Zooniverse" book and video content for social media as part of the Adler Planetarium's summer teen internship program.
3. Kei Smith - James B. Conant High School, Schaumburg, IL - Interviewed researchers of Zooniverse citizen science projects and produced written summaries for the annual "Into the Zooniverse" book and video content for social media as part of the Adler Planetarium's summer teen internship program.
2. Mahlet Shiferaw - Harvard University - Using Firefly to visualize CHIMES chemical abundances. Developed new functionality in Firefly to color particles by arbitrary scalar fields from FIRE simulation output. Used this new functionality to explore the distribution of HII and CO across the face of galactic disks run with CHIMES, a non-equilibrium chemistry module for galaxy formation simulations.
1. José Flores Velázquez - Cal Poly Pomona - Star formation indicators with bursty star formation histories. Modeled the H α and FUV luminosities of galaxies from the FIRE simulations using SLUG and BPASS, two widely used spectral modeling tools. Found the best fit averaging timescale for H α and FUV as indicators of star formation rate using realistic star formation histories extracted from the simulations.

COURSES

2. **Northwestern University** 2017-2018
teaching assistant · Astronomy-120 & Astronomy-101 & Astronomy-111 · taught a weekly lab section using the Dearborn 18.5" refracting telescope. Introduced students to the history of the historic Dearborn Observatory followed by an hour of observing seasonal objects in the night sky.
1. **Pennsylvania Governor's School** 2014
teaching/resident assistant · taught lecture, lab, and elective sections, while also mediating disputes and assisting students in their dormitories as a live-in counselor and administrator. Graded homeworks, held office hours and discussion sections, and led hands-on lab instruction.

OUTREACH / SERVICE

SERVICE

6. **Justice, Equity, Diversity, and Inclusion Mentorship Action Team** 2022-
team member · Led the development of a paired mentorship need survey and matching algorithm in order to build an extended multi-level mentorship network.
5. **FIRE Collaboration Seminar Committee** 2021-
Committee member · Solicited applications, evaluated abstracts, selected speakers, and organized the monthly FIRE Collaboration seminar-series as part of a team of three. Designed and tailored application system to highlight focus of series on junior members of the collaboration.
4. **P&A Faculty Search Committee** 2021
graduate student liaison · Co-led the graduate student interviews of faculty candidates. Produced extensive written summary for Faculty Search Committee representing the graduate students' feedback and impressions of candidates. Additionally presented this feedback to at a Search Committee meeting and sat in on final vote at P&A faculty meeting.
3. **Blue Waters Graduate Fellowship** 2021
application reviewer · Reviewed applications for the 2021 iteration of the Blue Waters Graduate Fellowship.
2. **Social Justice Initiative K12 Outreach Committee** 2020-2021
committee member · Synthesized input from local K12 teachers to design a series of new outreach programs directly serving teachers who self-identified as teaching at schools with predominantly underserved and underrepresented in STEM populations. Programs were recommended to SJI Coordinating Committee and ignored in favor of collaborating with internal Northwestern partners.

1. **Physics and Astronomy Graduate Student Council** 2018-
 Outreach Committee co-chair, Treasurer, and President · organized outreach opportunities for the graduate student community. Developed new graduate student peer mentoring program and oversaw operation of rest of council as treasurer and member of the executive council.

ONGOING OUTREACH

6. **Pathfinder Library** 2019-
 editor-in-chief · architected a new program for the development of educational brochures from original idea to deployment. Available both in print at CIERA in-person events and online to be printed at home, the Pathfinder brochure library is intended to give an authoritative and broad level overview of basic topics in astronomy. Additional resources are also listed from books, online tutorials, and youtube videos. See the online pathfinder library at ciera.northwestern.edu/pathfinder.
5. **Firefly** 2016-
 developer · acted as one of two primary developers for the publicly available browser-based visualization platform Firefly. Users can interactively fly through and filter their data without having to install any software. Visualization setups can be hosted on the web and shared by URL. You can try it yourself at ageller.github.io/Firefly or find the code at github.com/ageller/Firefly.
4. **Adler Planetarium - Astronomy Conversations** 2017-
 volunteer · gave monthly talks to the public at the Adler Planetarium's Space Visualization Lab (SVL) as part of Astronomy Conversations program. As one of the world's premier planetariums in a major metropolitan area the Adler serves a diverse audience with a wide range of ages and demographics which poses a challenging, yet rewarding, outreach task.
3. **Dearborn Astronomy Nights** 2017-
 staff · operated the historic Dearborn Telescope, an 18.5" refractor, at Northwestern's Dearborn Observatory for the weekly public observing sessions that are available both by appointment and as walk in sessions. The observatory can accommodate ~ 40 people and attracts a population of both seasoned amateur astronomers and young children alike.
2. **Astronomy on Tap** 2016-
 local organizer · engaged the public at local venues with professional astronomy talks, trivia, and prizes once per quarter as part of a national outreach effort.
1. **CIERA Astronomer Evenings** 2016-
 volunteer speaker · developed and delivered talks for the monthly public lectures at Northwestern's Dearborn Observatory.

PAST/ONETIME OUTREACH

17. **Thirteenth Annual CIERA Public Lecture** 2021
 volunteer coordinator and volunteer · Organized the event's "Ask an Astronomer" program which aimed to connect members of the public to CIERA astronomers in an informal and casual setting. Also volunteered as part of that program.
16. **Baxter Summer Scholars - Planet Detectives** 2021
 organizer · Wrote lesson plans and created simulated materials for a virtual 3-hour program for high school students to learn about Exoplanets. Students were tasked with investigating simulated lightcurves to choose the most likely candidate that hosted an exoplanet. Students were then asked to write a short proposal for follow-up spectroscopy, identify elements in the atmosphere of these planets using spectral features in simulated spectra, and finally characterize what their planet might be like based on the elements present.
15. **Math and Motion - Lincolnwood Elementary** 2021
 organizer · Developed an in-person 3-hour program for fourth and fifth grade students to learn about volume, area, and fractions by estimating the depth of Lake Michigan, building Lego creations to a specified surface area, and demonstrating the Pythagorean theorem with water and plexiglass squares.
14. **CIERA Astronomy LIVE** 2020-2021
 co-organizer · developed a new, flexible, virtual outreach program featuring CIERA astronomers focused on live Q&A, trivia, and short talks.
13. **CIERA Social Justice Initiative K12 Outreach Committee** 2020
 committee member · Synthesized input from local K12 teachers to design a series of new outreach programs directly serving teachers who self-identified as teaching at schools with predominantly underserved and underrepresented in STEM populations. Programs were recommended to SJI Coordinating Committee and ignored in favor of collaborating with internal Northwestern partners.

12. **Eleventh Annual CIERA Public Lecture** 2019
volunteer coordinator and volunteer · Organized the event's "Ask an Astronomer" program which aimed to connect members of the public to CIERA astronomers in an informal and casual setting. Also volunteered as part of that program.
11. **Skokie Public Library** 2018
invited speaker · Gave an hourlong invited lecture discussing the formation of cosmic structure and its measurement using Hydrogen absorption lines using the so called "Ly α Forest" to the gathered residents of Skokie township.
10. **Tenth Annual CIERA Public Lecture** 2018
volunteer coordinator and volunteer · Organized the event's "Ask an Astronomer" program which aimed to connect members of the public to CIERA astronomers in an informal and casual setting. Also volunteered as part of that program.
9. **P.E.O. Chapter GC** 2018
invited speaker · Gave an hourlong invited lecture describing the current events in astronomy ranging from landing on comets, discovering exoplanets, to the discovery and analysis of gravitational waves.
8. **Chicago Astronomical Society** 2018
invited speaker · Gave an hourlong invited lecture discussing the formation of cosmic structure and its measurement using Hydrogen absorption lines using the so called "Ly α Forest" to the gathered members of the CAS.
7. **College of DuPage - STEM-CON** 2017
volunteer · operated a booth at the College of DuPage's annual STEM-CON that engaged local families with demonstrations and conversations with STEM professionals in Chicago. Our booth alone had over 500 visitors ranging in ages from (young) children to adults.
6. **Haven Middle School** 2017
invited speaker · presented a talk about using virtual galaxies to explore the universe to the 8th grade science classes as part of a one-off visit to a local middle school.
5. **Wilmette Junior High Science Olympiad: Reach for the Stars** 2016
teacher · drafted lesson plans and taught a class of 5-8th grade students in basic astronomy and stellar evolution at a Chicago junior high school.
4. **Andrew Carnegie Society** 2015-2016
service funding committee member · orchestrated the allocation of funds to service organizations across campus including Habitat for Humanity, a CMU Haiti relief effort, and Doctors without Borders.
3. **Spring Carnival** 2015-2016
head of independent booths · planned and oversaw the construction of the 101st CMU Spring Carnival, a wildly popular event with the local community that engages both members of campus and the city of Pittsburgh.
2. **Society of Physics Students** 2013-2016
president, treasurer · contributed to department culture by organizing annual t-shirt designs and semesterly social events. Developed new set of events and activities with department to welcome incoming first year physics students.
1. **CMU Astronomy Club** 2012-2016
president, vice-president, observatory director · organized and facilitated annual outreach trip for >50 people to Green Bank Observatory to introduce undergraduates interested in astronomy to the fundamentals of radio astronomy. Marketed and hosted observation sessions for the public after meetings and for groups by reservation at the club's Truman Kohman Observatory.

REFERENCES

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Claude-André Faucher-Giguère
Northwestern University 2. Blakesley Burkhart
Rutgers University/Flatiron Institute CCA | <ol style="list-style-type: none"> 3. Aaron Geller
Northwestern University 4. Lars Hernquist
Harvard University |
|--|---|