JOHN MICHAEL BREWER

Assistant Professor, Physics & Astronomy SFSU

SFSU Physics & Astronomy
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CURRENT POSITION

Assistant Professor, San Francisco State University, August 2019-present; Lead Scientist for EXPRES & 100 Earths Project, July 2021-present

EDUCATION

Yale University — New Haven, CT

Ph.D. Astronomy, 2016

M.Phil. & MS in Astronomy, 2012

San Francisco State University — San Francisco, CA

Masters in Physics program 2008-2010, left for PhD program at Yale

New York University — New York, NY

Bachelor of Fine Arts, 1991

PROFESSIONAL POSITIONS

San Francisco State University , Assistant Professor, August 2019 - present

Yale University, Assistant Researcher, August 2018-Sept 2019

American Museum of Natural History, Research Educator, November 2016 - June 2019

Yale University, Post-doctoral Researcher, June 2016-August 2018

AWARDS & HONORS

Brouwer Prize for outstanding PhD thesis, Yale University, 2019

Yale University Wise Fellow, 2015-2016

San Francisco State University Marcy Research Fellowship, 2009-2010

PROFESSIONAL BIO

Bio: John Brewer started as an Assistant Professor at San Francisco State University in 2019 where his research group is focusing on the detection and characterization of exoplanets. His most recent work demonstrated the power of Extreme Precision Radial Velocities to uncover previously hidden planetary architectures in well studied systems. As a postdoc, then Associate Researcher at Yale University, Brewer continued his pursuit of accurate and precise stellar abundances to better understand planet formation while designing and developing the software for the EXPRES spectrograph. In 2015 he presented a new spectroscopic analysis procedure that delivers gravities consistent with those from asteroseismology in addition to abundances for 15 elements. Using this, and an updated catalog from *Kepler* targets in 2018, he was able to show that compact systems of rocky planets make up an increasing number of planetary systems at lower metallicities, that C/O ratios are low in local stars leading the magnesium silicate geology and that hot Jupiters may migrate via disk-free migration, and that initial chemical differences don't account for small planet radius differences. In 2010, Dr. Brewer designed the Planet Hunters citizen science tool and in 2011 built a web interface for the CHIRON spectrograph, drawing on knowledge from his previous career as a software developer and web designer.

TEACHING AT SFSU

Physics 111 (General Physics I), Astronomy 400/700 (Stellar Astrophysics, mixed Undergraduate & Graduate), Astronomy 405 (Exoplanetary Science), Astronomy 470 (Observational Techniques in Astronomy).

OTHER TEACHING, MENTORING AND OUTREACH

Noche de Estrellas, San Francisco State University, 2022-present
Started Spanish language public outreach program, led by students. Includes science talks, planetarium shows, and rooftop telescope viewing all in both Spanish and English.

Graduate Student Mentor, Yale University, 2018-2020
Lily Zhao and Malena Rice, Spectroscopic properties time series analysis and using machine learning of labels from physical models to analyze large spectroscopic data sets (papers in prep).

DeepAstronomy Hangout, Exoplanets Don't Like Heavy Metals, November 8, 2018
Invited to discuss latest research in video podcast supported by the AAS with the public.

Mentor, American Museum of Natural History, New York, NY, 2017-2018
Guiding three high school students in a research project modeling the effects of planet engulfment on stellar atmospheres. Science Research Mentorship Program at the museum.

Co-Teacher, American Museum of Natural History, New York, NY, 2016-present
Secrets of the Solar System, After School Program for high school students

Undergraduate Mentor, Yale University, 2015-2016
Justin Myles (Yale University), Lithium Abundances in Planet Search Stars (AAS 227 poster, paper in prep)

"Local Systems", Collaboration with Artist Natalia Porter, 2014
Collaborated on design of astronomy based art works presented in a solo show by the artist Natalia Porter, in Buffalo, NY, August 2014.

"Stellar Tea @ Yale", Organizer and host, Yale University, 2011-2015
Initiated, organized, and hosted weekly discussion on topics from exoplanets to star formation, to local dwarf galaxies. Included organizing guest speakers from within and outside Yale.

Teaching Fellow, Yale University, 2010-2013
Designed and led weekly discussion sessions, led exam review sessions, developed solution guides and supplemental materials, grading.

"Database Design for Astronomers", workshop organizer and instructor, Yale, June 2013

“Searching for Other Earths”, outreach talk, Leitner Observatory, Yale, Februrary 2013

“Around a Distant Star”, outreach talk, Leitner Observatory, Yale, April 2011

“Getting to Know the Neighbors”, outreach talk, North Salinas High School, Salinas, CA, May 2010

STUDENT ADVISEES

CURRENT GRADUATE STUDENTS

- Shvetha Suvarna Chynoweth, SFSU, M.S. Astronomy expected May 2025, Project: *Automated Keplerian Fitting using Machine Learning*
- Kameron Gausling, SFSU, M.S. Astronomy expected May 2024, Project: *Quantifying Macroturbulence using EXPRES Spectra for F, G, K, and M Dwarfs*
- Claire Komori, SFSU, M.S. Astronomy expected May 2024, Project: *The effects of Sun Spots on Spectral Line Shapes*

- Edward Ash, SFSU, M.S. Astronomy expected Dec 2023, Project: *Long Term Stability of Eccentricity in Tightly Packed Systems via Eccentricity Pumping*
- Elena Fader, SFSU, Calbridge Scholar, M.S. Physics/Astro expected Dec 2023, Project: *Effects of Spectral Resolution on RV Precision*
- Alan Chew, SFSU, M.S. Physics/Astro expected Dec 2023, Project: *Installation and Commissioning of Echelle Spectrograph at Leuschner Observatory*

CURRENT UNDERGRADUATE STUDENTS

- Truman Farr, SFSU, B.S. Physics/Astro expected May 2024, Project: *Identifying new planetary architectures with improved RV precision*