

Dr. Casey J. Law

CONTACT INFORMATION	Research Scientist Cahill Center for Astronomy and Astrophysics, Owens Valley Radio Observatory, California Institute of Technology Pasadena, CA 91125 +1-510-859-3636 claw@astro.caltech.edu
RESEARCH INTERESTS	<i>Astrophysical transients</i> , fast radio bursts, radio interferometry, surveys, algorithms and computing, data science, Python
EDUCATION	Northwestern University , Evanston, IL Ph.D., Astrophysics, 2007 <ul style="list-style-type: none">• Thesis: <i>Surveys of the Galactic Center and the Nature of the Galactic Center Lobe</i>• Research Topics: Multiwavelength observational astronomy and Galactic astrophysics• Adviser: Farhad Yusef-Zadeh Boston University , Boston, MA M.A., Astronomy, 2000 <ul style="list-style-type: none">• Research Topics: Radio spectroscopy, optical photometry• Advisers: James Jackson, Ken Janes, Tereasa Brainerd University of Hawai‘i, Manoa , Honolulu, HI B.S. with distinction, Physics, 1998 <ul style="list-style-type: none">• Research Topic: Observations of globular clusters• Advisor: James Heasley under a Hawai‘i Space Grant Fellowship
EMPLOYMENT	Research Scientist July 2019 to present Cahill Center for Astronomy and Astrophysics & Owens Valley Radio Observatory, Caltech <ul style="list-style-type: none">• Supervisor: Gregg Hallinan• Lead of Software and Algorithms Lab, OVRO Assistant Project Astronomer December 2011 to June 2019 Postdoctoral Fellow January 2009 to November 2011 Radio Astronomy Lab, UC Berkeley <ul style="list-style-type: none">• Supervisor: Geoff Bower and Carl Heiles• PI of <i>realfast</i> instrument at the Very Large Array Postdoctoral Fellow July 2006 to December 2008 Department of Astronomy, University of Amsterdam <ul style="list-style-type: none">• Supervisor: Ralph Wijers• Commissioning of the Low Frequency Array (LOFAR)

Astrophysicist

September 2000 to June 2002

Harvard-Smithsonian Center for Astrophysics

- Support astronomer for the *Chandra* X-ray Observatory

SELECT PUBLICATIONS

1. “On the Fast Radio Burst and Persistent Radio Source Populations”, Law, C. J., Connor, L., & Aggarwal, K., 2022, ApJ, 927, 55
2. “A repeating fast radio burst associated with a persistent radio source”, Niu, C.-H. et al, 2022, Nature, 606, 873
3. “The host galaxy and persistent radio counterpart of FRB 20201124A”, Ravi V. et al, 2022, MNRAS, 513, 982
4. “A repeating fast radio burst source in a globular cluster”, Kirsten, F. et al, 2022, Nature, 602, 585
5. “A Distant Fast Radio Burst Associated with Its Host Galaxy by the Very Large Array”, Law, C. J. et al. 2020, ApJ, 899, 161
6. “The Karl G. Jansky Very Large Array Sky Survey (VLASS). Science Case and Survey Design” Lacy, M. et al, 2020, PASP, 132
7. “A repeating fast radio burst source localized to a nearby spiral galaxy” Marcote, B. et al 2020, Nature, 577, 190
8. “A Search for Late-time Radio Emission and Fast Radio Bursts from Superluminous Supernovae” Law, C. J. et al 2019, ApJ, 886, 24
9. “Discovery of the Luminous, Decades-long, Extragalactic Radio Transient FIRST J141918.9+394036”, Law, C. J. et al. 2018, ApJ, 866, L22
10. “Highest Frequency Detection of FRB 121102 at 4-8 GHz Using the Breakthrough Listen Digital Backend at the Green Bank Telescope”, Gajjar, V. et al. 2018, ApJ, 863, 2
11. “An extreme magneto-ionic environment associated with the fast radio burst source FRB 121102”, Michilli, D. et al., 2018, Nature, 553, 182
12. “A direct localization of a fast radio burst and its host”, Chatterjee, S. et al 2017, Nature, 541, 58
13. “realfast: Real-time, Commensal Fast Transient Surveys with the Very Large Array”, Law, C.J. et al 2018, ApJS, 236, 8
14. “A Multi-telescope Campaign on FRB 121102: Implications for the FRB Population”, Law, C.J. et al, 2017, ApJ, 850, 76
15. “A Millisecond Interferometric Search for Fast Radio Bursts with the Very Large Array”, Law, C. J. et al 2015, ApJ, 807, 16
16. “The LOFAR Transients Pipeline”, Swinbank, J. D. et al, 2015, A&C 11, 25

17. “LOFAR: The LOw-Frequency ARray”, van Haarlem, M. et al 2013, A&A, 556, 2
18. “All Transients, All the Time: Real-time Radio Transient Detection with Interferometric Closure Quantities”, Law, C. J. et al 2012, ApJ, 749, 143
19. “Spectropolarimetry with the Allen Telescope Array: Faraday Rotation toward Bright Polarized Radio Galaxies”, Law, C. J. et al 2011, ApJ, 728, 57
20. “A Multiwavelength View of a Mass Outflow from the Galactic Center”, Law, C. J. 2010, ApJ, 708, 474
21. “Green Bank Telescope Multiwavelength Survey of the Galactic Center Region”, Law, C. J., et al. 2008, ApJS, 177, 255
22. “X-Ray Observations of Stellar Clusters Near the Galactic Center”, Law, C. & Yusef-Zadeh, F. 2004, ApJ, 611, 858

PROFESSIONAL
HONORS AND
SERVICE

Chair, Natural Resources and Environmental Commission, City of South Pasadena, 2020 – present

Reviewer for SARAO (MeerKAT), NCRA (GMRT), FAST, NRAO, NASA and NSF, 2013 – present

Referee for the Astrophysical Journal, Astronomical Journal, MNRAS, PASP, and New Astronomy, 2006 – present

SOC member, IAU Symposium 369, “The Dawn of Cosmology & Multi-Messenger Studies with Fast Radio Bursts”, 2022

Co-organizer, 3rd URSI Atlantic Radio Science meeting, Session on Techniques of Time-Domain Astrophysics, 2022

Mentor and Judge, Student Faculty Programs, Caltech, 2020 – present

Member, NRAO Users Committee, 2019 – 2022

Member, VLA Sky Survey Survey Science Group, 2014 – 2022

Judge, AAS Chambliss poster competition, 2020 – 2022

Editor, Astronomy and Computing, 2018 – 2019

Visitor, Dunlap Institute for Astronomy and Astrophysics, University of Toronto, July 2018

External Review Committee, CHIME/FRB project, 2017 – 2018

Organizer, Radio Astronomy Lab Hack day, 2017

Organizer, Berkeley Astronomy arxiv coffee, 2017 – 2019

Member, Berkeley Institute for Data Science, 2014 – 2019

Jansky Very Large Array Resident Observer, 2012

Chair (LOC) and member (SOC) for “LOFAR and the Transient Radio Sky”, 2008

Huang Fellowship at Northwestern University, 2002 – 2003

Two Presidential Fellowships (Research and Teaching) at Boston University, 1998 – 2000

Four merit-based tuition waivers from the Department of Physics at the University of Hawai‘i, 1995 – 1998

Hawai‘i Space Grant Fellowship, 1997

TEACHING AND
OUTREACH **Caltech**, Pasadena, CA

Student Advising **2019 – 2021**

- Caltech programs: Summer Undergraduate Research Fellowship, Freshman Summer Research Institute, and the Summer Research Consortium
- Graduate students: **Kshitij Aggarwal** (co-advisor and thesis committee; West Virginia Univ.), **Wael Farah** (thesis examiner; Swinburne Univ.), **Emma Platts** (Kavli project co-mentor; Univ. of Cape Town)
- Undergraduates **Carlos Ayala**, **Tyrone McNichols**, **Jerome (Johnny) Seebeck**, **Evan Seebeck**, **Rey Squillace**
Co-advisors: Gregg Hallinan, Vikram Ravi

Lecturing and Volunteering **2019 – 2022**

- OVRO Astronomy Lecture Series – Lecturer, 2022
- Arroyo Vista Elementary, South Pasadena – Science Night co-organizer, 2021-2022

UC Berkeley, Berkeley, CA

Student Advising **2009 – 2019**

- Graduate students: **Peter Williams**, **Chat Hull**, and **James McBride**
Co-advisors: Carl Heiles and Geoff Bower
- Undergraduates: **Luis Chinchilla-Garcia** (UC LEADS prgram), **Bridget Andersen**, **Sabrina Berger**, **Sanyum Channa**, **Andrew Halle**, **Jun Tan**, **Yawen Sun**, **Kyle Blanchard**, and **Phillip Sells**
- Breakthrough Listen intern program

Lecturing and Volunteering **2009 – 2019**

- Prison University Project – Five years as lead math tutor for college-level curriculum in San Quentin State Prison
- Science@Cal – Six years as co-organizer of monthly lecture series and participation in annual “Cal Day” events
- Open Oakland – Participated in projects related to air quality, open software, and civic hacking

- UCB Astronomy 290 – Two guest lectures in graduate course on department research
- Franklin Elementary, Oakland, California – Two visits to present astronomy concepts to 3rd graders
- Mount Diablo Astronomical Society – Guest lecture on radio transients
- Splunk Inc. – Guest lecture on radio transients at Splunk Science Society lecture series
- Cal-Bridge – Co-organized workshop for Python in Astronomy for CSU-UC bridge program

University of Amsterdam, Amsterdam, The Netherlands

Student Advising

2006 – 2007

- **Thijs Coenen**
Co-adviser: Ralph Wijers.

Northwestern University, Evanston, IL

Teaching Assistant

2004

- Taught weekly physics discussion session with roughly 100 students

Observatory Host

2003 – 2006

- Led monthly open night tours at Dearborn Observatory

Boston University, Boston, MA

Teaching Assistant

1999 – 2000

- Taught four astronomy lab sections per semester (including night labs)

University of Hawaii at Manoa, Honolulu, HI

Co-organizer, Hawai'i Physics Olympics

1996 – 1998

- Helped organize annual, state-wide event for high school students
- Designed events to test understanding of physical concepts

Co-organizer, Physics Tutoring

1996 – 1998

- Developed and led volunteer physics tutoring service for undergraduates

GRANTS

Collaborator: Canadian Initiative for Radio Astronomy Data Analysis (CIRADA), Canada Foundation for Innovation, 2017

PI: Real-time, commensal transient detection at the VLA (*realfast* project), NSF, Advanced Technology and Instrumentation grant, awarded 2016.

Senior staff: Anomaly detection with fast imaging radio interferometers. University of California Office of the President grant, awarded 2012.

Co-I: A Coherent Transient Detection System for SKA Pathfinders. University of Western Australia Collaboration grant, awarded 2012.

PI: Meeting of LOFAR and the Transient Radio Sky. NWO and NOVA (NL) collaboration support grants, awarded 2008.

PI: Development of a spatio-spectral analysis technique for X-ray data. *Chandra* archival research grant, awarded 2003.

SOFTWARE

1. “rfpipe: Radio interferometric transient search pipeline”, Law, C. J. 2017, ASCL, 1710.002
2. “vysmaw: Fast visibility stream muncher”, Pokorny, M. & Law, C. J. 2017, ASCL, 1710.001
3. “rtpipe: Searching radio interferometry data for fast, dispersed transients”, Law, C. J. 2017, ASCL, 1706.002
4. “tpipe: Searching radio interferometry data for fast, dispersed transients”, Law, C. J. 2016, ASCL, 1603.012