

# KENNETH W. LIN

## University Address

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## Permanent Address

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## EDUCATION

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### M.A., Ph.D., Astrophysics

Started 2020

UNIVERSITY OF CALIFORNIA AT BERKELEY

### B.S. Physics, B.S. Astronomy, *magna cum laude*, with minor in Mathematics

May 2020

UNIVERSITY OF MASSACHUSETTS AMHERST

*Commonwealth Honors College Scholar with Greatest Distinction*

Thesis: "Next Generation Imaging of Dusty Galaxies with TolTEC on the LMT"

## RESEARCH EXPERIENCE

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UNIVERSITY OF MASSACHUSETTS AMHERST, AMHERST, MA

1/2017 – present

Undergraduate Research Assistant, Department of Astronomy

Advisors: Prof. Alexandra Pope, Prof. Grant Wilson (Committee Member)

- Developed simulations and prediction diagnostics for upcoming TolTEC polarimeter on the Large Millimeter Telescope to identify and handle anticipated confusion and multiplicity of galaxy clusters in the data collection pipeline for planned Large Scale Structure Survey, using Python. This work culminated in my undergraduate senior honors thesis.
- Awarded Massachusetts NASA Space Grant Travel Funding to present research poster at the American Astronomical Society (AAS) Winter Meeting 2018.
- Awarded \$1,750 as a Honors College Research Assistant Fellowship in 2017-18 for work in this group.

HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS, CAMBRIDGE, MA

6/2019 – 8/2019

National Science Foundation REU Fellow, High-Energy Astrophysics Division

Advisors: Drs. Dong-Woo Kim & Nazma Islam (NASA GSFC)

- Investigated origin of multiphase gas in early-type galaxies by analyzing asymmetries in the physical structures of extended hot gaseous halos to reveal the roles of mechanisms such as AGN and stellar feedback on their formation.
- Added *XMM-Newton* archival observations to build 2D maps and 3D radial profiles of temperature, pressure, density, mass, and iron abundance in halos to develop an X-ray galaxy atlas that complements *Chandra* observations. Computationally-intensive tasks made use of Smithsonian's *Hydra* supercluster.
- Developed an internal and public-facing website interface for accessing our atlas maps and profiles.

GRADUATE SCHOOL OF SCIENCE, KYOTO UNIVERSITY, JAPAN

6/2018 – 8/2018

Nakatani RIES U.S. Research Fellow, Department of Physics, Solid State Spectroscopy Group

Advisors: Profs. Takashi Arikawa, Koichiro Tanaka, Junichiro Kono (Rice Univ.)

- Selected as one of twelve Nakatani Foundation U.S. Fellows nationally to conduct research in Japan.
- Fabricated and characterized free carrier dynamics of MoS<sub>2</sub> and WSe<sub>2</sub> transition metal dichalcogenides on substrate LiNbO<sub>3</sub> using Raman spectroscopy, atomic force microscopy, and near-field optical-pump terahertz-probe spectroscopy.
- Completed three-week orientation with cultural seminars, solid state physics lectures, and 40 hours of language classes.
- Awarded 'Best Undergraduate Poster Presentation' at Smalley-Curl Institute Research Colloquium at Rice University.

FIVE COLLEGE ASTRONOMY DEPARTMENT, AMHERST, MA  
FCAD Summer Intern

5/2017 – 7/2017

- Developed diagnostics for disentangling AGN and SF activity in dusty regions with the MIRI instrument filters on NASA's upcoming James Webb Space Telescope (JWST).
- Created color-color plots and a multidimensional regression algorithm to classify the emission of these high redshift ( $1 \leq z \leq 4$ ) infrared sources, using empirical Spitzer-based SED libraries.

## OBSERVING EXPERIENCE

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KITT PEAK NATIONAL OBSERVATORY  
WIYN 0.9-m, 4 nights

## TEACHING EXPERIENCE

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UNIVERSITY OF MASSACHUSETTS AMHERST, AMHERST, MA  
Undergraduate Teaching Assistant, Department of Physics

9/2017 – 12/2017, 9/2018 – 6/2020

- Served as a teaching assistant for Physics 181 (Introductory Mechanics), a required introductory course for physics and astronomy majors, Physics 115 (Physics of Music), a general education course, both in a team-based learning classroom, and Astronomy 105 (Weather and Our Atmosphere), a general education course.
- Held review sessions and office hours for students prior to exams; provided student performance feedback to instructor by grading assignments and laboratory section work.

Peer Mentor, Society of Physics Students

2019–2020

- Guide first- and second-year undergraduates in the physics major through informal advising and helping students adjust to the level of coursework expected in physics classes.
- Help students get involved in research groups in the physics and astronomy departments, and providing assistance with applications for external internships and REU opportunities.
- Student panelist for information and workshop sessions on applying to internships and summer programs in research.

## OUTREACH & ADVOCACY

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UMASS SCIENCE POLICY & ADVOCACY INITIATIVE (SciPOL)  
Co-Founder and President

10/2019 – 5/2020

- The underrepresentation of scientists and engineers in policymaking motivated the creation of SciPol, a new registered student organization aimed at exposing undergraduates to the intersection of science and policy through writing policy briefs, connecting students with local representatives in the state government and Congress, and hosting workshops discussing the most pressing issues in science such as artificial intelligence and space junk that requires careful legislation to regulate.
- Developed organizational constitution, strategic plan, and financial requirements, with plans to financially sponsor advanced undergraduates to attend the AAAS CASE Workshop on a yearly basis.
- Officially granted Registered Student Organization status which is given to only 5% of applying potential organizations and recruited over 25 members in our first semester with a broad range of majors from the sciences to the humanities and assembled a diverse leadership team with undergraduates from the first year to the fourth year.

AMERICAN ASTRONOMICAL SOCIETY  
AAS Astronomy Ambassador

11/2019 – present

- Selected as an AAS Ambassador for the 2020 cohort to participate in training workshops that promote effective public outreach and communication techniques.

## SELECTED AWARDS & HONORS

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Elected to Phi Beta Kappa	2020
Rising Researcher Award, University of Massachusetts Amherst	2019
Barry M. Goldwater Scholarship	2019
William F. Field Alumni Scholar, UMass Amherst Alumni Association	2019
SPS Top Presenter Award March Meeting, American Physical Society	2019
Rick A. Pitino Presidential Medal Scholarship, University of Massachusetts	2018
Hokkaido University Fund Scholarship Award, UMass College of Natural Sciences	2017, 2018
Nominated Contestant, Five College Japanese Speech Contest	2018
NASA Space Grant Summer Fellowship, Massachusetts Space Grant Consortium	2017
Dean's Award Four-Year Scholarship, University of Massachusetts	2016-2020
Stanley Z. Koplik Certificate of Mastery Full Tuition Scholarship	2016-2020

## TALKS & CONFERENCES

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**K. Lin**, D.-W. Kim, N. Islam, A. Mossman. "The Extended, Asymmetric Hot Gaseous Halos of Early-Type Galaxies." *235th American Astronomical Society Meeting*, Honolulu, HI, January 2020. Poster.

**K. Lin**, D.-W. Kim, N. Islam, A. Mossman. "The X-ray Picture of the Extended Hot Gaseous Halos in Early-Type Galaxies." *Gulf Coast Undergraduate Research Symposium*, Houston, TX, November 2019. Invited oral session.

**K. Lin**, S. Kusaba, T. Arikawa, F. Blanchard, K. Tanaka. "Ultrafast Carrier Dynamics of Exfoliated Transition Metal Dichalcogenides with Optical-Pump Terahertz-Probe Microscopy." *American Physical Society March Meeting*, Boston, MA, March 2019. Oral. *Top Presenter Award*.

**K. Lin**, S. Kusaba, T. Arikawa, F. Blanchard, K. Tanaka. "Ultrafast Carrier Dynamics of Exfoliated Transition Metal Dichalcogenides with Optical-Pump Terahertz-Probe Microscopy." *Gulf Coast Undergraduate Research Symposium*, Houston, TX, October 2018. Invited oral session.

**K. Lin**, S. Kusaba, T. Arikawa, F. Blanchard, K. Tanaka. "Ultrafast Carrier Dynamics of Exfoliated Transition Metal Dichalcogenides with Optical-Pump Terahertz-Probe Microscopy." *4th Annual Smalley-Curl Institute Summer Research Colloquium*, Houston, TX, August 2018. Poster. *Best Presentation Award*.

**K. Lin**, A. Pope, A. Kirkpatrick. "Hunting for AGN in JWST/MIRI Imaging." *231st American Astronomical Society Meeting*, Washington, D.C., January 2018. Poster.

## SOCIETIES & AFFILIATIONS

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Phi Beta Kappa

Member, American Astronomical Society (2019- )

Member, American Physical Society (2017- )

Member, American Association for the Advancement of Science (2019- )

## SKILLS

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Proficient with Python, MATLAB, Java, JavaScript, HTML/CSS, Igor Pro, PASCO Capstone, ImageJ, Microsoft Office, Unix/Shell, Windows OS, MacOS, L<sup>A</sup>T<sub>E</sub>X

## LANGUAGES

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Natively fluent in English, Taiwanese, Hakka, Mandarin  
Proficient in French  
Learning Japanese

## REFERENCES

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Prof. Alexandra Pope  
Department of Astronomy  
University of Massachusetts Amherst  
710 North Pleasant Street  
Amherst, MA 01003  
✉ [pope@astro.umass.edu](mailto:pope@astro.umass.edu)

Dr. Dong-woo Kim  
Harvard-Smithsonian Center for Astrophysics  
60 Garden Street  
Cambridge, MA 02138  
✉ [dkim@cfa.harvard.edu](mailto:dkim@cfa.harvard.edu)

Prof. Junichiro Kono  
Department of Electrical & Computer Engineering  
Rice University  
6100 Main Street  
Houston, TX 77005  
✉ [kono@rice.edu](mailto:kono@rice.edu)

Prof. Takashi Arikawa  
Department of Physics  
Kyoto University  
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