Daichi Hiramatsu

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Education

- **University of California, Santa Barbara** — Santa Barbara, CA, USA
  Ph.D. in Physics with Astrophysics Emphasis — *July 2019 – Sept. 2021*
  - Dissertation: Mapping Core-Collapse and Superluminous Supernova Observables to Their Progenitors
- **University of California, Santa Barbara** — Santa Barbara, CA, USA
  M.A. in Physics with Astrophysics Emphasis — *Sept. 2016 – July 2019*
- **University of Hawai'i at Mānoa** — Honolulu, HI, USA
  B.S. in Physics, Minor in Astrophysics — *Aug. 2014 – May 2016*
- **De Anza College** — Cupertino, CA, USA
  Major in Physics and Engineering — *Sept. 2012 – June 2014*

Research

- **Center for Astrophysics | Harvard & Smithsonian** — Cambridge, MA, USA
  Postdoctoral Fellow — *Oct. 2021 – Present*
  - Advisor: Prof. Edo Berger; Topic: Superluminous Supernovae and Kilonovae with MMT and Magellan
- **Las Cumbres Observatory** — Goleta, CA, USA
  Graduate Student Researcher — *Jan. 2017 – Sept. 2021*
  - Advisor: Prof. D. Andrew Howell; Topic: Core-Collapse and Superluminous Supernovae with Las Cumbres Observatory
- **Institute for Astronomy – University of Hawai'i** — Honolulu, HI, USA
  Undergraduate Researcher — *Jan. 2016 – May. 2016*
  - Advisor: Prof. John Tonry; Topic: Unbiased Wide Range Survey for RR Lyraes with ATLAS
- **University of Hawai'i at Mānoa** — Honolulu, HI, USA
  Undergraduate Researcher — *Jan. 2015 – Aug. 2015*
  - Advisor: Prof. John Lindner and Prof. John Learned; Topic: Nonlinear Dynamics of Variable Stars with Kepler
  - Advisor: Prof. Sven Vahsen; Topic: Novel Algorithm for High-Resolution Neutron Tomography

Observing

Magellan Telescopes: Imaging and Spectroscopy with the Inamori-Magellan Areal Camera & Spectrograph (IMACS) and the Low Dispersion Survey Spectrograph (LDSS-3)

MMT Observatory: Imaging and Spectroscopy with the Blue Channel Reticon Spectrograph and Binospec

Fred Lawrence Whipple Observatory: Imaging with KeplerCam

Las Cumbres Observatory: Imaging with SBIG, Sinistro, Spectral and Spectroscopy with FLOYDS

Gemini Observatory: Spectroscopy with the Gemini Multi-Object Spectrographs (GMOS)

Neil Gehrels *Swift* Observatory: Imaging with the Ultraviolet/Optical Telescope and Imaging and Spectroscopy with the X-Ray Telescope

Hubble Space Telescope: Imaging with the Wide Field Camera 3 (WFC3) and the Advanced Camera for Surveys (ACS)

Lick Observatory: Imaging with the Nickel Direct Imaging Camera and Spectroscopy with the Kast Double Spectrograph and Hamilton Echelle Spectrograph

W. M. Keck Observatory: Spectroscopy with the Low Resolution Imaging Spectrometer (LRIS)

Asteroid Terrestrial-impact Last Alert System: Imaging with the Pathfinder

University of Hawai'i 2.2m Telescope: Imaging with the Orthogonal Parallel Transfer Imaging Camera

Teaching

- **University of California, Santa Barbara** — Santa Barbara, CA
  Teaching Assistant — *Sept. 2016 – June 2018*
  - ASTRO 1. Basic Astronomy
  - ASTRO 2. History of the Universe
  - PHYS 1. Basic Physics
  - PHYS 3L. Basic Physics Laboratory
  - PHYS 132. Stellar Structure and Evolution
  - PHYS 133. Galaxies and Cosmology
- **University of Hawai'i at Mānoa** — Honolulu, HI
  Math and Science Tutor — *Jan. 2015 – May 2016*
- **De Anza College** — Cupertino, CA
  Math and Science Tutor — *Sept. 2013 – June 2014*

Outreach

- **Japan-US Science Forum** — Boston, MA, USA
  Coordinate member of an interdisciplinary meeting to solve worldwide problems — *Oct. 2021 – Present*
- **Astronomy on Tap Santa Barbara** — Santa Barbara, CA
  Coordinate member of free, public astronomy-related presentations in a bar — *Jan. 2018 – Sept. 2021*

Awards and Honors

- **Top 10 space stories of 2021** — Waukesha, WI
  Astronomy Magazine — *Year 2021*
- **10 Best Research Stories of 2021** — Oakland, CA
  University of California | Office of the President — *Year 2021*
- **Academic Year Fellowship** — Santa Barbara, CA
  Department of Physics – University of California, Santa Barbara — *Academic Year 2016-17*
- **The College of Natural Sciences Achievement Scholarship** — Honolulu, HI
  Department of Physics & Astronomy – University of Hawai'i at Mānoa — *Spring 2015 & Spring 2016*
- **International Undergraduate Student Scholarship** — Honolulu, HI
  International Student Services – University of Hawai'i at Mānoa — *Academic Years 2014-15 & 2015-16*
- **Phi Beta Kappa** — Honolulu, HI
  Alpha of Hawai'i Chapter – University of Hawai'i at Mānoa — *Spring 2016–Present*
- **Golden Key** — Honolulu, HI
  International Honour Society – University of Hawai'i at Mānoa — *Fall 2015–Present*
- **Phi Theta Kappa** — Cupertino, CA
  Alpha Sigma Alpha Chapter – De Anza College — *Spring 2013–Present*

Software

- `lcogtgemini` — github.com/cmccully/lcogtgemini
  Reduces spectra from the Gemini Observatory GMOS
- `snhst` — github.com/cmccully/snhst
  Measures photometry on images from the Hubble Space Telescope
- `lcogtsnpipe` — github.com/LCOGT/lcogtsnpipe
  Measures photometry on images from the Las Cumbres Observatory
- `floyds_pipeline` — github.com/LCOGT/floyds_pipeline
  Reduces spectra from the Las Cumbres Observatory FLOYDS spectrographs

Presentations

Invited Talks

7. **Stella Nova 2021** — Hiroshima, Hiroshima, Japan (virtual)
Talk: "GSP Observations of Electron-Capture Supernova 2018zd" — *Nov. 2021*

6. **Caltech/IPAC Lunch Seminar** — Pasadena, CA, USA (virtual)
Talk: "Progenitor Mass Spectrum of Core-Collapse Supernovae" — *Jan. 2021*

5. **NAOJ Science Colloquium** — Mitaka, Tokyo, Japan (virtual)
Talk: "Progenitor Mass Spectrum of Core-Collapse Supernovae" — *Jan. 2021*

4. **ASIAA Colloquium** — Taipei, Taiwan, ROC
Talk: "Recent Advancements in Core-collapse Supernova Observation" — *Jan. 2020*

3. **Kavili IPMU APEC Seminar** — Kashiwa, Chiba, Japan
Talk: "Recent Advancements in Core-collapse Supernova Observation" — *Nov. 2019*

2. **Time-domain astronomy workshop 2019** — Sendai, Miyagai, Japan
Talk: "Hydrogen-rich Supernova Observation and Modeling" — *Oct. 2019*

1. **Kyoto University Astronomy Seminar** — Kyoto, Kyoto, Japan
Talk: "Recent Advancements in Core-collapse Supernova Observation" — *Oct. 2019*

Contributed Talks

6. **AAS 240 Summer Meeting** — Pasadena, CA, USA
Talk: "The electron-capture origin of supernova 2018zd" — *June 2022*

5. **ASJ 2022 Spring Annual Meeting** — Hiroshima, Hiroshima, Japan (virtual)
Talk: "A Possible Ia-CSM Origin of Superlinear Supernovae" — *Mar. 2022*

4. **Online-Meetings on Evolved Stars and Systems 2.0** — Virtual
Talk: "The Electron-Capture Supernova 2018zd" — *Dec. 2021*

3. **ASJ 2021 Autumn Annual Meeting** — Kyoto, Kyoto, Japan (virtual)
Talk: "The Electron-Capture Supernova 2018zd" — *Sept. 2021*

2. **Stellar deaths and their diversity** — Mitaka, Tokyo, Japan
Talk: "Type II Short-plateau Supernovae" — *Jan. 2019*

1. **Chaos Among the Stars?** — Honolulu, HI, USA
Talk: "Extracting Fractal Dimensions from Uneven Time Series" — *Aug. 2015*

Publications

Lead Author

3. Hiramatsu, D., Moriya, T. J., Howell, D. A., Arcavi, I., Burke, J. et al., "*Superlinear Type II Superluminous Supernovae 2017fck and 2019cmv: A Possible Origin from Interacting Type Ia Supernovae*," in prep.

2. Hiramatsu, D., Howell, D. A., Moriya, T. J., Goldberg, J. A., Hosseinzadeh, G. et al., 2021, "*Luminous Type II Short-Plateau Supernovae 2006Y, 2006ai, and 2016egz: A Transitional Class from Stripped Massive Red Supergiants*," ApJ, 913, 55

1. Hiramatsu, D., Howell, D. A., Van Dyk, S. D., Goldberg, J. A., Maeda, K. et al., 2021, "*The electron-capture origin of supernova 2018zd*," Nature Astronomy, 5, 903

Major Contribution

8. Jacobson-Galán, W. V., Margutti, R., Kilpatrick, C. D., **Hiramatsu, D.**, Perets, H. et al., 2020, "*SN 2019ehk: A Double-peaked Ca-rich Transient with Luminous X-Ray Emission and Shock-ionized Spectral Features*," ApJ, 898, 166

7. Pellegrino, C., Howell, D. A., Sarbadhicary, S. K., Burke, J., **Hiramatsu, D.**, et al., 2020, "*Constraining the Source of the High-velocity Ejecta in Type Ia SN 2019ein*," ApJ, 897, 159

6. French, K. D., Arcavi, I., Zabludoff, A. I., Stone, N., **Hiramatsu, D.**, et al. 2020, "*The Structure of Tidal Disruption Event Host Galaxies on Scales of Tens to Thousands of Parsecs*," ApJ, 891, 93

5. Gangopadhyay, A., Misra, K., **Hiramatsu, D.**, Wang, S., Hosseinzadeh, G. et al. 2020, "*Flash ionization signatures in the type Ibn supernova SN 2019uo*," ApJ, 889, 170

4. Anderson, J. P., Pessi, P. J., Dessart, L., Inserra, C., **Hiramatsu, D.**, et al., 2018, "*A nearby super-luminous supernova with a long pre-maximum & 'plateau' and strong C II features*," A&A, 620, 67

3. Sand, D. J., Graham, M. L., Botyánszki, J., **Hiramatsu, D.**, McCully, C., et al., 2018, "*Nebular Spectroscopy of the 'Blue Bump' Type Ia Supernova 2017cbv*," ApJ, 863, 24

2. Graham, M. L., Kumar, S., Hosseinzadeh, G., **Hiramatsu, D.**, Arcavi, I., et al., 2017, "*Nebular-Phase Spectra of Nearby Type Ia Supernovae*," MNRAS, 472, 3437

1. McCully, C., **Hiramatsu, D.**, Howell, D. A., Hosseinzadeh, G., Arcavi, I., et al. 2017, "*The rapid reddening and featureless optical spectra of the optical counterpart of GW170817, AT 2017gfo, during the first four days*," ApJL, 848, L32

Collaboration

53. Gangopadhyay, A. et al., 2022, "*Evolution of A Peculiar Type Ibn Supernova SN 2019wep*," ApJ, accepted, arXiv:2203.15194

52. Fiore, A. et al., 2021, "*Close, bright and boxy: the superluminous SN 2018hti*," MNRAS, accepted, arXiv:2111.07142

51. Tucker, D. et al., 2021, "*SOAR/Goodman Spectroscopic Assessment of Candidate Counterparts of the LIGO–Virgo Event GW190814*," ApJ, accepted, arXiv:2109.13351

50. Graham, M. L. et al., 2022, "*Nebular-phase spectra of Type Ia supernovae from the Las Cumbres Observatory Global Supernova Project*," MNRAS, 511, 3682

49. Irani, I. et al., 2022, "*Less than 1% of Core-Collapse Supernovae in the local universe occur in elliptical galaxies*," ApJ, 927, 10

48. Ni, Y. Q. et al., 2022, "*Infant-phase reddening by surface Fe-peak elements in a normal Type Ia Supernova*," Nature Astronomy, February 2022

47. Pellegrino, C. et al., 2022, "*Circumstellar Interaction Powers the Light Curves of Luminous Rapidly Evolving Optical Transients*," ApJ, 926, 125

46. Kilpatrick, C. D. et al., 2021, "*The Gravity Collective: A Search for the Electromagnetic Counterpart to the Neutron Star-Black Hole Merger GW190814*," ApJ, 923, 258

45. Wang, Q. et al., 2021, "*SN 2018agk: A Prototypical Type Ia Supernova with a Smooth Power-law Rise in Kepler (K2)*," ApJ, 923, 167

44. Armstrong, P. et al., 2021, "*SN2017jgh - A high-cadence complete shock cooling lightcurve of a SN IIb with the Kepler telescope*," MNRAS, 507, 3125

43. Sand, D. J. et al., 2021, "*Circumstellar Medium Constraints on the Environment of Two Nearby Type Ia Supernovae: SN 2017cbv and SN 2020nlb*," ApJ, 922, 21

42. Parrag, E. et al., 2021, "*SN 2019hcc: a Type II supernova displaying early O II lines*," MNRAS, 506, 4819

41. Jencson, J. E. et al., 2021, "*AT 2019qyl in NGC 300: Internal Collisions in the Early Outflow from a Very Fast Nova in a Symbiotic Binary*," ApJ, 920, 127

40. Burke, J. et al., 2021, "*A Bright Ultraviolet Excess in the Transitional 02es-like Type Ia Supernova 2019yvq*," ApJ, 919, 142

39. Medler, K. et al., 2021, "*SN 2020cpg: an energetic link between type IIb and Ib supernovae*," MNRAS, 506, 1832

38. Zeng, X. et al., 2021, "*SN 2017fgc: A Fast-expanding Type Ia Supernova Exploded in Massive Shell Galaxy NGC 474*," ApJ, 919, 49

37. Utrobin, V. P. et al., 2021, "*Enormous explosion energy of Type IIP SN 2017gmr with bipolar Ni-56 ejecta*," MNRAS, 505, 116

36. Gutiérrez, C. P. et al., 2021, "*The double-peaked type Ic Supernova 2019cad: another SN 2005bf-like object*," MNRAS, 504, 4907

35. Pritchard, T. A. et al., 2021, "*The Exotic Type Ic Broad-lined Supernova SN 2018gep: Blurring the Line between Supernovae and Fast Optical Transients*," ApJ, 915, 121

34. Cannizzaro, G. et al., 2021, "*Accretion disc cooling and narrow absorption lines in the tidal disruption event AT 2019dsg*," MNRAS, 504, 792

33. Baltay, C. et al., 2021, "*Low-redshift Type Ia Supernova from the LSQ/LCO Collaboration*," PASP, 133, 4002

32. Fiore, A. et al., 2021, "*SN 2017gci: a nearby Type I Superluminous Supernova with a bumpy tail*," MNRAS, 502, 2120

31. Xiang, D. et al., 2021, "*The Peculiar Transient AT2018cow: A Possible Origin of a Type Ibn/IIn Supernova*," ApJ, 910, 42

30. Zeng, X. et al., 2021, "*SN 2017hpa: A Nearby Carbon-rich Type Ia Supernova with a Large Velocity Gradient*," ApJ, 909, 176

29. Khetan, N. et al., 2021, "*A new measurement of the Hubble constant using Type Ia supernovae calibrated with surface brightness fluctuations*," A&A, 647, 72

28. Malyali, A. et al., 2021, "*AT 2019avd: a novel addition to the diverse population of nuclear transients*," A&A, 647, 9

27. Barna, B. et al., 2021, "*SN 2019muj – a well-observed Type Iax supernova that bridges the luminosity gap of the class*," MNRAS, 501, 1078

26. Rho, J. et al., 2021, "*Near-infrared and Optical Observations of Type Ic SN 2020oi and Broad-lined Type Ic SN 2020bvc: Carbon Monoxide, Dust, and High-velocity Supernova Ejecta*," ApJ, 908, 232

25. Tartaglia, L. et al., 2021, "*The Early Discovery of SN 2017ahn: Signatures of Persistent Interaction in a Fast-declining Type II Supernova*," ApJ, 907, 52

24. Dong, Y. et al., 2021, "*Supernova 2018cuf: A Type IIP Supernova with a Slow Fall from Plateau*," ApJ, 906, 56

23. Prentice, S. J. et al., 2020, "*SN 2018gjx reveals that some SNe Ibn are SNe IIb exploding in dense circumstellar material*," MNRAS, 499, 1450

22. Gutiérrez, C. P. et al., 2020, "*SN 2017ivv: two years of evolution of a transitional Type II supernova*," MNRAS, 499, 974

21. Nicholl, M. et al., 2020, "*An outflow powers the optical rise of the nearby, fast-evolving tidal disruption event AT2019qiz*," MNRAS, 499, 482

20. Short, P. et al., 2020, "*The tidal disruption event AT 2018hyz - I. Double-peaked emission lines and a flat Balmer decrement*," MNRAS, 498, 4119

19. Yang, Y. et al., 2020, "*The Young and Nearby Normal Type Ia Supernova 2018gv: UV-Optical Observations and the Earliest Spectropolarimetry*," ApJ, 902, 46

18. Gomez, S. et al., 2020, "*The Tidal Disruption Event AT 2018hyz II: Light-curve modelling of a partially disrupted star*," MNRAS, 497, 1925

17. Müller-Bravo, T. E. et al., 2020, "*The low-luminosity Type II SN 2016aqf: a well-monitored spectral evolution of the Ni/Fe abundance ration*," MNRAS, 497, 361

16. Bostroem, K. A. et al., 2020, "*Discovery and Rapid Follow-up Observations of the Unusual Type II SN 2018ivc in NGC 1068*," ApJ, 895, 31

15. Han, X. et al., 2020, "*SN 2017cfd: A Normal Type Ia Supernova Discovered Very Young*," ApJ, 892, 142

14. Leloudas, G. et al., 2019, "*The Spectral Evolution of AT 2018dyb and the Presence of Metal Lines in Tidal Disruption Events*," ApJ, 887, 218

13. Andrews, J. E. et al., 2019, "*SN 2017gmr: An energetic Type II-P supernova with asymmetries*," ApJ, 885, 43

12. Galbany, L. et al., 2019, "*Evidence for a Chandrasekhar-mass explosion in the Ca-strong 1991bg-like type Ia supernova 2016hnk*," A&A, 630, 76

11. Trakhtenbrot, B. et al., 2019, "*1ES 1927+654: an AGN Caught Changing Look on a Timescale of Months*," ApJ, 883, 94

10. Pastorello, A. et al., 2019, "*A luminous stellar outburst during a long-lasting eruptive phase first, and then SN IIn 2018cnf*," A&A, 628, 93

9. Brown, P. J., et al., 2019, "*Red and Reddened: Ultraviolet through Near-Infrared Observations of Type Ia Supernova 2017erp*," ApJ, 877, 152

8. Sand, D. J., et al., 2019, "*Nebular Hα Limits for Fast Declining SNe Ia*," ApJL, 877, 4

7. Szalai, T., et al., 2019, "*The Type II-P Supernova 2017eaw: From Explosion to the Nebular Phase*," ApJ, 876, 19

6. Hosseinzadeh, G., et al., 2019, "*Type Ibn Supernovae May not all Come from Massive Stars*," ApJL, 871, 9

5. Dimitriadis, G., et al., 2019, "*K2 Observations of SN 2018oh Reveal a Two-component Rising Light Curve for a Type Ia Supernova*," ApJ, 870, 1

4. Li, W., et al., 2019, "*Photometric and Spectroscopic Properties of Type Ia Supernova 2018oh with Early Excess Emission from the Kepler 2 Observations*," ApJ, 870, 12

3. Taddia, F., et al., 2019, "*Analysis of broad-lined Type Ic supernovae from the (intermediate) Palomar Transient Factory*," A&A, 621, 71

2. Sollerman, J., et al., 2019, "*Late-time observations of the extraordinary Type II supernova iPTF14hls*," A&A, 621, 30

1. LIGO Scientific Collaboration and Virgo Collaboration et al., 2017, "*Multi-Messenger Observations of a Binary Neutron Star Merger*," ApJL, 848, 12

Submitted

6. Hosseinzadeh, G. et al., 2022, "*Weak Mass Loss from the Red Supergiant Progenitor of the Type II SN 2021yja*," ApJ, submitted, arXiv:2203.08155

5. Valerin, G. et al., 2022, "*Low luminosity Type II supernovae - IV. SN 2020cxd and SN 2021aai, at the edges of the sub-luminous supernovae class*," MNRAS, submitted, arXiv:2203.03988

4. Wevers, T. et al., 2022, "*An elliptical accretion disk following the tidal disruption event AT 2020zso*," A&A, submitted, arXiv:2202.08268

3. Medler, K. et al., 2022, "*SN 2020acat: A purr-fect example of a fast rising Type IIb Supernova*," MNRAS, submitted, arXiv:2201.06991

2. Brennan, S. J. et al., 2021, "*An impostor among us II: Progenitor, environment, and modelling of AT 2016jbu*," MNRAS, submitted, arXiv:2102.09576

1. Brennan, S. J. et al., 2021, "*An impostor among us I: Photometric and spectroscopic evolution of AT 2016jbu*," MNRAS, submitted, arXiv:2102.09572

Astronomical Circulars

245 transient classifications and circulars (89 as lead author).