Thomas de Jaeger *Curriculum vitae*

CONTACT INFORMATION

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SYNOPSIS OF THE CV

I am an astronomer with broad and multidisciplinary interests spanning supernova science, multi-messenger astronomy, massive stars, and cosmology. I obtained a PhD in Astronomy from Universidad de Chile in 2016 under the supervision of Prof. Mario Hamuy. Then, I continued my research in supernovae, with Prof. Alexei Filippenko at the University of California, Berkeley. After this, I was a Research Postdoctoral Associate at the University of Hawaii, working with Prof. Benjamin Shappee on multi-messenger astronomy. Since December 2022, I have been a postdoc at the Université Pierre & Marie Curie (France), working with Prof. Nicolas Regnault and analysing Type Ia supernovae from the Zwicky Transient Factory to constrain the dark energy equation of state. I am the first author of 12 publications in peer-to-peer reviews, including the most precise Universe expansion rate measurement from Type II supernovae. In total, I have published 65 original articles in top international peer-reviewed journals, including seven papers led by under and graduate students that I mentored. With a total of 2,100 citations and a h-index of 25, my works are recognised worldwide. I have been invited to edit a book on the Hubble Tension for the Springer Series in Astrophysics and Cosmology (https://www.springer.com/). I delivered over ten talks, of which seven were invited seminars at various Universities in Chile, France, Portugal, USA, and two outreach talks. Finally, I have PIed five observational campaigns at the largest observatories in the world.

RESEARCH INTERESTS

Core-collapse supernovae, cosmological used of supernovae, peculiar velocities, cosmography, multi-messenger astronomy, reddening law, host-galaxy, metallicity, CSM interaction, progenitors, observational strategies: Distance determination using Type II and Type Ia supernovae. Matter distribution using peculiar velocities. Electromagnetic counterpart to a gravitational-wave source or neutrino events. Blazars. Spectral analysis. Light-curve and colour-curve properties. Host-galaxy extinction and supernova intrinsic colours. The physics of supernova explosions (Shock breakout). Progenitor properties.

RESEARCH EXPERIENCE

Postdoctoral fellowship, Université Pierre & Marie Curie, LNPHE, Paris, France
2022–present
- Adviser: Professor Nicolas Regnault

2020–2022 **Postdoctoral fellowship**, University of Hawai'i, Mānoa, USA
- Adviser: Professor Ben Shappee

2016–2020 **Postdoctoral Scholar**, University of California, Berkeley, USA
- Adviser: Professor Alex Filippenko

2011–2016 **PhD student**, University of Chile (Santiago, Chile)
- Adviser: Professor Mario Hamuy

2011–2012 **Investigation project**, University of Chile (Santiago, Chile)
- Adviser: Professor Sebastian Lopez

2010 **M.Sc. research project**, Côte d'Azur Observatory (Nice, France)
- Adviser: Professor Denis Mourard

EDUCATION

2011–2016 **Ph.D. in Astrophysics**, Universidad de Chile (Santiago, Chile)
- Thesis Topic: Independent evidence for the cosmic acceleration from Type II supernovae.
- Adviser: Professor Mario Hamuy

2010–2011 **Master degree in Fundamental Physics**, University of Toulouse III (Toulouse, France)

2008–2010 **Master degree in Astrophysics Space Science and Planetology**, University of Toulouse III (Toulouse, France)
- Intership Topic: Stellar fundamental parameters using the Center for High Angular Resolution Astronomy (CHARA).
- Adviser: Professor Denis Mourard

2005–2008 **B.Sc. in Fundamental Physics**, University of Toulouse III (Toulouse, France)

TEACHING

Supervising and mentoring activities

2020–present **University of Hawai'i, Mānoa:**
• *Hawaii Supernovae flows*, Oct 20 – Present
Aaron Do, PhD student (two papers in prep.)
• *ASAS-SN follow-up of IceCube high-energy neutrino alerts*, Jan 22 – July 22
Jannis Necker, PhD student at Deutsches Elektronen-Synchrotron DESY **(See publication #2)**

2017–present **University of California, Berkeley:**
• *Extracting Cosmological Utility from Sparsely Observed Type Ia Supernovae.*
Jan 20 – May 21
Benjamin Stahl, PhD student **(See publications #12, 13, 16, 19, 20)**
• *Distribution of Si II λ6355 velocities of Type Ia supernovae.*
Aug 19 – Jun 20
Keto Zhang, undergraduate student **(See publications #15)**
• *Analysis of the SN II parameters to reduce the scatter in the Hubble diagram.*
Aug 17 – Jun 18
Derek Perera, undergraduate student
• *SN 2015V Photometric and spectroscopic studies.*
Olivia Jerram, undergraduate student
Aug 17 – Jun 18

Teaching Assistant

2018
- Member of the Science Olympiad team

2014–2016
- Teaching assistant for undergraduate and PhD students, Universidad de Chile, Chile
(General astronomy, Observational astronomy, Galaxy).

OUTREACH ACTIVITIES

Public talks 2014–present

- Public lecture at University of California Berkeley: A evening with the stars (2019).
- Public lecture at City of College San Francisco: The accelerating Universe (2018).
- Cerro Calan Observatory public talks (Chile): General astronomy (2012–2015).

2012–2015 **Observatory guided visits**

- Cerro Calan Observatory (Chile): elementary schools, high schools, and general public.

RESEARCH COLLABORATIONS

- Mid-Infrared SupernovA Collaboration (MIRSNAC) (2022-present, PI: Ashall, C.)

2020–present • All-Sky Automated Survey for Supernovae (ASAS-SN, PI: Shappee, B.)

2020–present • Spectral Classification of Astronomical Transients survey (SCAT, PI: Shappee, B.)

2020–present • Member of the Host galaxies properties and supernova flows (HOSTFLOWS, PI: Galbany, L.)

2020–present • Member of the Hawaii Supernova flows (HISNFLOWS, PI: Shappee, B.)

2017–present • Participant of the Dark Energy Survey Type II supernova

2016–present • Member of UC Berkeley Filippenko Group's Supernova

2013–present • Member of the High Cadence Transient Survey (HiTS, PI: F. Forster)

2013–present • Participant of the Carnegie Supernovae Project-I (CSP-I, PI: M. Phillips, M. Hamuy)

2013–2016 • Member of the Millennium Institute of Astrophysics (MAS, PI: M. Hamuy)

2012–2016 • Member of the Public Spectroscopic Survey of Transient Objects (PESSTO, PI: S. Smartt, M. Sullivan)

2011–2013 • Member of the Millennium Center for Supernova Studies (MCSS, PI: M. Hamuy)

OBSERVING EXPERIENCE

Optical imaging and spectroscopy,

- FOCAS at Subaru telescope at Mauna Kea Observatory (8 n)
- SNIFS at UH2.2m telescope at Mauna Kea Observatory (40 n)
- LDSS3 at CLAY telescope at Las Campanas Observatory (6 n)
- WFCCD at Du Pont telescope at Las Campanas Observatory (3 n)
- EFOSC2 and SOFI at NTT telecope at La Silla Observatory (3 n)
- DECam at Blanco telescope at Cerro Tololo Inter-American Observatory (8 n)
- GOODMAN at SOAR telescope on the Cerro Pachon (4 n)
- KAST at Shane telescope at Lick Observatory (10 n)
- LRIS at Keck telescope at Mauna Kea Observatory (6 n)
- Deimos at Keck telescope at Mauna Kea Observatory (5 n)

Optical interferometry,

- VEGA with the CHARA at Mount Wilson Observatory (5 n)

Data reduction/analysis experience:

- Reduced Optical/NIR imaging
- Reduced Optical long-slit spectroscopy
- Experienced user of IRAF reduction

OBSERVATIONAL PROJECTS

- 2022B, UH2.2m Telescope, Mauna Kea, USA. Four nights with SNIFS.

- 2022B, Subaru Telescope (8.2m), Mauna Kea, USA. Four nights with FOCAS.
- 2022A, Subaru Telescope (8.2m), Mauna Kea, USA. Two half nights with FOCAS.
- 2022A, UH2.2m Telescope, Mauna Kea, USA. Four nights with SNIFS.
- 2021B, Gemini North Telescope (8.2m), Mauna Kea, USA. eight hours with GMOS as rapid Target of Opportunity (rToO).
- 2021A, Gemini North Telescope (8.2m), Mauna Kea, USA. eight hours with GMOS as rapid Target of Opportunity (rToO).
- 2018A, Keck Telescope (10m), Mauna Kea, USA. three half nights with DEIMOS.
- 2017B, Keck Telescope (10m), Mauna Kea, USA. three half nights with DEIMOS.
- 2013A, Blanco Telescope (4m), Cerro Tololo Inter-American Observatory, USA. three nights with DECAM.

LANGUAGES

- French: mother tongue
- English: Advanced
- Spanish: fluent

COMPUTER SKILLS

- Op. Systems: Ubuntu, Windows
- Astronomy: IRAF, Sky cat, Sextractor
- Computing: Python programs (scipy, pyfits, pyraf, matplotlib, emcee, sklearn, MontePython), Matlab
- Others: LaTeX, Powerpoint

FELLOWSHIPS AND GRANTS AWARDED

- JWST cycle 1,2021, (ID: 2114), PI: Ashall C., Co-I: inc. **T. de Jaeger**, "MIR Spectroscopy of Type Ia Supernovae: The Key To Unlocking Their Explosions and Element Production", 317,651 USD

2021
- JWST cycle 1, (ID: 2122), PI: Ashall C., Co-I: inc. **T. de Jaeger**, "Dust, Mass Loss and Explosions of Massive Stars in the MIR", 292,290 USD

2021
- Proyecto Nacional (ID2020-115253GA-I00), PI: Galbany L., Co-I: inc. **T. de Jaeger**, "Cornering the Hubble tension by studying systematics with SNe (HOSTFLOWS)", 155,577 EUR

2020
- Hubble Space Telescope Cycle 28, PI: Filippenko A., Co-I: inc. **T. de Jaeger**, "A Snapshot Survey of the Sites of Recent, Nearby Supernovae", awarded 54 Snapshot Targets

2020–2020
- Hawaii Supernova flows Postdoctoral Fellow, 2020–2022: 150,000 USD

2016–2020
- Bengier Postdoctoral Fellow: 200,000 USD

2018
- AAS travel grant: 2,000 USD

2017
- ESO visitor program: 5,000 USD

2017
- Supernovae Through the Ages travel grant: 2,500 USD

2013–2016
- PhD fellowship: Millenium of Astrophysics: 37,000 USD

2013
- IAU Symposium 296: Supernova environmental impacts: 3,000 USD

2011–2013
- PhD fellowship: Millennium Center for Supernova Studies: 24,000 USD

PUBLICATIONS

- 65 total refereed publications, 12 first author, 9 with significant contribution; 6 papers led by grad students and 1 by undergrad student.
- 50 TNS reports, 11 CBETS, 56 ATELs, 2 GCNs

- Total citations: >2100, h-index=25.

INVITED PRESENTATIONS & SEMINARS

• CosmoVerse Seminars (Apr 2023).
online
Seminar Talk: *Mar 2023 Type II supernovae and the H0 tension*

Apr 2022 • Particle Physics Seminar Committee.
Brookhaven National Laboratory, Brookhaven, USA
Seminar Talk: *Tension between the local Universe and the CMB: should the LCDM model be challenged or not?*

March 2021 • Institute for Astronomy.
University of Hawaii, Mānoa, USA
Seminar Talk: *Type II Supernova Cosmology: H0 and S8 tensions.*

July 2020 • Correcting Reddening Intelligently for cosmological Supernova Probes (CRISP).
Lisboa, PORTUGAL
Contributed Talk: *Implications of varying Rv in cosmology.*

April 2019 • Evening with the stars.
University of California, Berkeley, USA
Outreach Talk: *SNe II cosmology.*

January 2019 • Center for astrophysics and gravitation.
Instituto Superior Técnico, Lisboa, PORTUGAL
Seminar Talk: *SNe II cosmology: Past and future.*

January 2019 • Laboratoire de physique nucléaire et de hautes énergies.
Paris, FRANCE
Invited Talk: *SNe II cosmology: a bright future.*

January 2019 • Laboratoire de physique de Clermont-Ferrand.
Clermont-Ferrand, France.
Invited Talk: *Supernovae de Type II: propriétés physiques et cosmologie.*

August 2018 • A symposium celebratring Alex Filippenko's 60th birthday.
Aptos, CA, USA
Contributed Talk: *SNe II cosmology: a bright future.*

April 2018 • City of Collage San Francisco.
San Francisco, USA
Outreach Talk: *The accelerating Universe..*

April 2018 • European Week of Astronomy and Space Science.
Liverpool, UK
Contributed Talk: *SNe II cosmology: a bright future.*

April 2017 • European Southern Observatory.
Santiago, CHILE
Invited Talk: *SNe II cosmology: Past and future.*

April 2017 • South American Supernovae (SAS).
La Serena, CHILE
Contributed Talk: *Extending the Type II supernova Hubble diagram beyond z=0.3.*

December 2016 • Astro-explosions discussion.
UC Berkeley, USA
Contributed Talk: *Type II supernovae as distance indicators.*

August 2016

	• SN2016: Supernovae through the ages. Easter Island, CHILE Poster: *A Type II Supernova Hubble diagram from the CSP, SDSS-II and SNLS surveys.*
April 2015	• South American Supernovae (SAS). Santiago, CHILE Contributed Talk: *The first SNe II HD using the photometric colour method.*
April 2014	• Milllenium Institute of Astrophysics workshop. Los Andes, CHILE. Poster: *Host-galaxy extinction using 3 different methods.*
April 2013	• ESO: The deaths of stars and the lives of galaxies. Santiago, CHILE. Poster: *A double plateau and unprecendented circumstellar variable sodium in the transient SN 2011A.*
January 2013	• IAU Symposium 296: Supernova Environmental Impacts. Raichak, INDIA. Poster: *A double plateau and unprecendented circumstellar variable sodium in the transient SN 2011A.*

INTERESTS AND ACTIVITIES

- Sports: Football, Rugby
- Travels: Africa, Asia, Europe, South/North America
- Gastronomy

September 5, 2023