

Curriculum Vitae

Andreas Faist | Associate Scientist at Caltech/IPAC | afaist@caltech.edu

Personal Information

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Research Interests

- Physics during the Epoch of Reionization
- Early phases of galaxy formation and evolution
- Structural and chemical properties of high-redshift galaxies
- Quenching of star formation in massive galaxies
- Machine Learning, Big Data, and Data Visualization

Main Leads and Involvements

U.S. lead principal investigator (PI) of **ALPINE** (a 70-hour ALMA program), PI of its 57-hour **JWST/IFU extension**, and PI of **CHAMPS** (a 145-hour ALMA program) ★ PI of **SLETE**, a \$500k Euclid GO NASA grant ★ Member of the **science steering committee of the COSMOS survey** ★ Co-investigator of **COSMOS-Web** (a 255h JWST cycle 1 program) ★ Co-lead of the **IPAC Joint Pixel Survey Processing (JSP)** ★ Science co-lead of the **IPAC Science Platform** (a precursor of the NASA science platform) ★ Science and pipeline team co-lead of **SPHEREx** (0.2m infrared telescope) ★ Science co-investigator of **ATLAS** (concept for a 1.5m infrared telescope for near-infrared spectroscopy) and Science Operation Center lead and co-lead of galaxy formation working group of **SIRMOS** (concept infrared telescope) ★ Science team member and co-lead of AGN working group for **CASTOR** (a Canada-led UV space telescope) ★ Member of the **PRIMA** (proposed far-IR space telescope) science team ★ Member of the **Euclid consortium** and co-lead of the Caltech/IPAC Euclid spectroscopy pipeline team ★ Science steering committee member of the **Subaru medium-band consortium**, a Japanese-US collaboration to enhance the medium-band photometry over $>700 \text{ deg}^2$ using Subaru's Hyper Supreme-Cam.

Career and Education

Mar 2025 to present Associate Research Scientist at Caltech/IPAC
Jan 2019 to Mar 2025 Assistant Research Scientist at Caltech/IPAC
Oct 2016 to Dec 2018 Postdoctoral Researcher at Caltech/IPAC
May 2015 to Oct 2016 SNSF Postdoctoral Fellow at Caltech (Visitor in Astronomy)
April 2015 Dr. Sc. ETH Zurich in Physics
 Thesis: *"The Evolution of Star-forming and Quiescent Massive Galaxies through Cosmic Time"*
March 2011 M.Sc. in Physics at ETH Zurich
 Thesis: *"Star-forming Galaxies at Redshifts $z \sim 2$ and $z \sim 4$ "*
September 2009 B.Sc. in Physics at ETH Zurich

Honors and Awards

July 2025 Performance bonus for contribution to SPHEREx
March 2025 Promotion from Assistant to Associate Scientist
August 2022 Performance bonus for contributions as co-lead of the Joint Survey Processing Project
April 2014 SNSF Early Postdoc Mobility Fellowship (equivalent to NASA Hubble Fellowship):
"Towards a Coherent Picture of Galaxy Evolution during the Cosmic Dawn and Epoch of Re-ionization"
March 2012 ETH Medal for outstanding Master thesis
March 2011 M.Sc. in Physics Cum Laude at ETH Zurich

Third-Party Funding, Grants, and Selected Proposals

I am the principal investigator (PI) or co-PI of an equivalent of **more than 420h of observations and more than \$1.44M of related grants**. In addition, I am co-investigator of more than 2100h of observations and ~\$4M related grants. I have more than **32 nights of direct experience in observing with the Keck telescopes**.

Summary of accepted observing proposals or grants for which I am the PI (or co-PI):

- 2025, Keck, 2026A** *The First Spatially Resolved Mapping of Metal Enrichment, Ionization, and Dust in $z \sim 1$ Galaxies*
(**1 night**, Proposal ID #C391, PI: Faisst/Liu/Zmuidzinas)
- 2025, Keck, 2025B** *Solving the mystery of [CII] halos at $z \sim 5$ by combining the power of Keck/KCWI, JWST and ALMA*
(**2 nights**, Proposal ID #U279, PI: Faisst/Mobasher)
- 2025, NASA/Euclid** *Blind to 100,000 Strong Lenses: Spectroscopic Analysis with SLETE, a Strong Lens Extraction Tool for Euclid*
(**\$500k NASA/Euclid grant over 2 years to develop SLETE, PI: Faisst**)
- 2024, HST, Cycle 32** *The False positive in the Lyman Continuum escape fraction estimation*
(**22 orbits, \$25k**, Proposal ID #4761, PI: Y. Lin (Postdoc), co-PI: Faisst)
- 2024, JWST, Cycle 3** *A Deep Look into PAHs: Resolved PAH and Fine-Structure Emission in $z=1$ Main-Sequence Galaxies*
(**47.7 hours, \$310k**, Proposal ID #4761, PI: Faisst)
- 2024, ALMA, SOS** ALMA/SOS grant to support graduate student (Lun-Jun Liu, Caltech) to on ALPINE (Title: "Study the extended [CII] halos in ALPINE galaxies using the FIRE cosmological simulations") - **\$40k**
- 2023, ALMA, Cycle 10** *Quiescent or Not? Deep ALMA Observations of a Quiescent Galaxy at $z=7.3$*
(**15.6 hours**, Proposal ID #2023.1.00521.S, PI: Faisst)
- 2023, ALMA, Cycle 10** *The COSMOS High- z ALMA-MIRI Population Survey (CHAMPS): A Wide-Area Comprehensive Survey of the Dusty Universe*
(**143.5 hours**, Proposal ID # 2023.1.00180.L, PI: Faisst)
- 2023, JWST, Cycle 2** *Witnessing the Maturing of Teenage Galaxies at $z = 4 - 6$ with a Comprehensive UV - Optical - Sub-mm Benchmark Sample for the Community (ALPINE follow-up)*
(**57 hours, \$360k**, Proposal ID #3045, PI: Faisst)
- 2022, HST, Cycle 30** *Compact oddballs in COSMOS: The Faint End of the $z>6$ Quasar Luminosity Function and the Growth of Ionized Bubbles*
(**14 orbits, \$90k**, ACS/WFC grism spectroscopy, Proposal ID #17091, PI: Faisst)
- 2021, JWST, Cycle 1** *Beasts in the Bubbles: Characterizing ultra-luminous galaxies at Cosmic Dawn*
(**13.8 hours**, Proposal ID #2659, North America co-PI: Faisst)
- 2019, ALMA, Cycle 7** *Unraveling the complex ISM of $z=4.5$ galaxies: With the largest sample of [NII]205+[CII]158 detected galaxies*
(**28.4 hours**, Proposal ID #2019.1.00535.S, PI: Faisst)
- 2019, HST, Cycle 26M** *HST imaging for an immediate study of the ISM in $z=4.5$ galaxies*
(**6 orbits, \$30k**, WFC3/IR, Proposal ID #15692, PI: Faisst)
- 2018, ALMA, Cycle 6** *Are high-redshift Galaxies hot? Constraining the temperatures of $z\sim 5.5$ galaxies*
(resubmission, 11.1 hours, Proposal ID #2018.1.00348.S, PI: Faisst)
- 2018, Keck 2018B** *[OIII] Emitters in the Epoch of Reionization: Clues to Early Galaxy Formation*
(**1.5 nights, \$17k**, MOSFIRE, Proposal ID #20/2018B_N144, PI: Faisst)
- 2017, ALMA, Cycle 5** *ALPINE: The ALMA Large Program to INvestigate C+ at Early times*
(**69.3 hours**, Proposal ID #2017.1.00428.L, North America Lead PI: Faisst)
- 2017, ALMA, Cycle 5** *Are high-redshift Galaxies hot? Constraining the temperatures of $z\sim 5.5$ galaxies*

(11.1 hours, Proposal ID #2017.1.00479.S, PI: Faisst)

2015 - 2017

SNSF Early Postdoc Mobility Fellowship (equivalent to NASA Hubble Fellowship):
"Towards a Coherent Picture of Galaxy Evolution during the Cosmic Dawn and Epoch of Re-Ionization" – \$71k

Teaching Experience and Student/Postdoc Mentoring

I have supervised three postdocs and (co-) mentored seven graduate students, as well as several undergraduate and high school students.

Postdocs:

Aug. 2024 – present Current Postdoc **Wuji Wang** (Caltech)
 Aug. 2023 – present Current Postdoc **Yu-Heng Lin** (Caltech)
 Jul 2021 – Jul. 2024 Postdoc **Marziye Jafariyazani** (Caltech)

Graduate Students:

2026 – present Summer graduate student: **Alex Rodriquez** (Univ. Michigan)
 Topic: *"Extended Dark Matter Massin Massive Galaxy Cluster MACSJ0600: From the Perspective of Observations and Simulations"*

2025 – present Caltech graduate student: **Lunjun (Simon) Liu** (supported by an ALMA grant)
 Topic: *"Investigation of [CII] halos in $z = 5$ galaxies using the FIRE cosmological simulations"* ([Liu et al. in prep](#))

2025 – 2026 Summer graduate student: **Karina Barboza** (Ohio State University)
 Topic: *"The mid to far-IR properties of quiescent galaxies in COSMOS-Web and CHAMPS"*

2022 – 2023 Master thesis co-advisor: **Patrizia Bussatori** (Univ. Padova, IT; Univ. Geneva, CH)
 Topic: *"Unveiling the nature of [CII] rich galaxies in the Early Universe with JWST observations"* ([Bussatori et al. in prep](#))

Spring/Summer 2020 Summer graduate student: **Brittany Vanderhoof** (Rochester Int. of Technology)
 Topic: *"The first optical [OII] and far-IR C^+ analysis of the ISM conditions of a galaxy at $z \sim 4.58$ "* ([Vanderhoof et al. 2021, MNRAS, 511, 1303](#))

Summer 2019 Summer graduate student: **Yoshinobu Fudamoto** (University of Geneva)
 Topic: *"The ALPINE-ALMA [CII] survey. Dust attenuation properties and obscured star formation at $z \sim 4.4-5.8$ "*
 ([Fudamoto et al. 2020, A&A, 64, 4](#))

Fall 2019 Summer graduate student: **Thomas Venville** (Swinburne University)
 Topic: *"Identifying transient and variable sources with machine learning"*
 ([Venville et al. 2024, PASA, 41, 110](#))

Spring 2018 Summer graduate student: **Rebecca Larson** (U. Texas)
 Topic: *"Redshifts Derivation from Galaxy Clustering"*

Undergraduate and High School Students:

I have mentored **8 undergraduate students** and **one high school student**. Two of the undergraduate students (part of the Caltech SURF program) have successfully published a paper ([Barisic et al. 2017, ApJ, 845, 41](#) and [Zhang et al. 2025, ApJ 992, 3](#)). In 2025, I **taught a 5-week research program to three incoming Caltech undergraduate students** as part of the First-Year Success Research Institute (FSRI), which helps underrepresented minorities to catch up on course work (calculus, coding, scientific writing) before starting their classes at Caltech.

Other Teaching:

2025	5-week research course for incoming Caltech undergraduate students
2016 – 2020, 2025 – present	Organizer of the Caltech Galaxy Formation journal club. Brings together students, postdoc and faculty to discuss recent publications in the field of extragalactic astronomy.
January 2020/2021	Machine learning workshops at the yearly meetings of the American Astronomical Society (AAS). Total 120/80 participants.
Spring 2015	Astrophysics II (Prof. M. Carollo), ETH Zurich
Fall 2014	Physics I (Prof. S. Lilly), ETH Zurich
Spring 2014	Astrophysics II (Prof. M. Carollo), ETH Zurich
Spring 2013	Astrophysics II (Prof. M. Carollo), ETH Zurich
Fall 2012	Physics I (Prof. M. Carollo), ETH Zurich
Fall 2012 & 2013	Astronomy Week (advanced bachelor lab), ETH Zurich

Invited Colloquia, Conference Talks, and Workshops

A summary of invited colloquia, conference talks, and (organized) workshops.

Invited Colloquia, Conference Talks, and Participations in Workshops as External Expert

March 2026	Invited Expert: <i>“Star Forming Galaxies in the Reionization Epoch: ALMA-Driven Studies with the Aid of JWST”</i> ; Ishigaki-Jima (Okinawa, Japan)
February 2026	Invited Expert: <i>“From Dust to Dawn”</i> ; Lorentz Center (Leiden, Netherlands)
January 2026	Invited Expert: <i>“High Redshift Galaxies in High Definition”</i> ; University of Western Australia (Perth, Australia)
December 2025	Colloquium: <i>“Tracing Resolved Star Formation, Dust, and Gas through 12 Billion Years of Cosmic Time”</i> ; UCLA (Los Angeles, USA)
October 2025	Colloquium: <i>“Cosmic Evolution of Star Formation, Gas, and Dust in Galaxies”</i> ; Caltech (Pasadena, USA)
August 2025	Invited Expert: <i>“2nd HSC Medium-band Filter Workshop”</i> ; Discussion of science cases for use of Subaru medium-band filters. Representative for collaboration with U.S. Keck users. (Nagoya University, Japan)
December 2024	Invited Expert: <i>“2nd HSC Medium-band Filter Workshop”</i> ; Discussion of science cases for use of Subaru medium-band filters. Representative for collaboration with U.S. Keck users. (Nagoya University, Japan)
December 2024	Invited Expert: <i>“Views on the early Universe with ALMA and JWST”</i> ; Lorentz Workshop: Views on the early Universe with ALMA and JWST (Leiden, Netherlands)
September 2024	Talk: <i>“The ISM and dust properties of (post-)reionization galaxies probed by ALMA and JWST”</i> ; Views on the multi-phase interstellar medium in galaxies (Bologna, Italy)
July 2024	Colloquium: <i>“Unveiling the Mysteries of the Early Universe with a Synergy of ALMA and JWST”</i> ; KASI (Daejeon, South Korea)
July 2024	Colloquium: <i>“Unveiling the Mysteries of the Early Universe with a Synergy of ALMA and JWST”</i> ; University Hiroshima (Hiroshima, Japan)
July 2024	Review Speaker: <i>“Early JWST results of the early Universe”</i> ; COSPAR, Session “JWST: Science Highlights from the First Two Years” (Busan, South Korea)
April 2024	Invited Talk: <i>“CHAMPS: Exploring the Dusty Universe”</i> ; Bridging the Models & Observations of Galaxies’ Dust in the JWST Era (Trieste, Italy)
December 2023	Colloquium: <i>“From Dusty and Gaseous to Massive and Quiescent – Following the Evolution of Galaxies with ALMA and JWST”</i> ; University Geneva (Geneva, Switzerland)
December 2023	Colloquium: <i>“From Dusty and Gaseous to Massive and Quiescent – Following the Evolution of Galaxies with ALMA and JWST”</i> ; UC Santa Barbara (Santa Barbara, CA, USA)

September 2023	Colloquium: “From Dusty and Gaseous to Massive and Quiescent – Following the Evolution of Galaxies with ALMA and JWST”; UC Davis (Davis, CA, USA)
May 2023	Invited Talk: “First characterization of globular clusters (or stripped dwarfs?) around the host galaxies of SMACS0723 at $z=0.4$ ”; A multi-wavelength view on globular clusters near and far: from JWST to the ELT (Sexten, Italy)
November 2022	Colloquium: “Teenage Galaxies and More - A Multi-Wavelength View of Galaxy Evolution”; KASI, (Daejeon, South Korea)
July 2022	Invited Talk: “ALPINE: A Large Survey to Understand Teenage Galaxies”; From galaxies to cosmology with deep spectroscopic surveys (Marseille, France)
August 2021	Invited Talk: “ALPINE – the Largest Survey to Understand Teenage Galaxies” Contributed Talk: “Oddballs in COSMOS – High-Redshift Quasars or Junk?”; The 2021 Greater IPAC Science Symposium (Pasadena, CA, USA)
February 2020	Colloquium: “Star formation and Dust in the Early Universe”; Caltech (Pasadena, CA, USA)
February 2020	Invited Talk: “Studying the first Galaxies with Spitzer”; Spitzer Legacy Conference at Caltech (Pasadena, USA)
October 2019	Invited Expert: “ALPINE – The first multi-wavelength survey to study galaxies at $4 < z < 6$ (from UV to FIR wavelengths)”; Lorentz Workshop: Revolutionary Spectroscopy of Today as a Springboard to the James Webb Space Telescope (Leiden, Netherlands)
February 2019	Colloquium: “Galaxies in the Early Universe: In the view of newest observations with Spitzer, ALMA, and HST”; DAWN center (Copenhagen, Denmark)
February 2019	Colloquium: “Galaxies in the Early Universe: The view from the newest observations with Spitzer, ALMA, and HST”; Rochester Institute of Technology (Rochester NY, USA)
December 2018	Colloquium: “Galaxies in the Early Universe: The view from the newest observations with Spitzer, ALMA, and HST”; Harvard-Smithsonian Center for Astrophysics (Cambridge, MA, USA)
September 2018	Colloquium: “Galaxies in the Early Universe: The view from the newest observations with Spitzer, ALMA, and HST”; Saint Mary’s University (Halifax, NS, Canada)
August 2016	Colloquium: “Insights into the High-Redshift Universe using Spitzer and Local Galaxies”; ETH Zurich (Zurich, Switzerland)

(Co-) Organized Workshops and Conferences:

October 2025	Co-Organizer: <i>Infrared Spectroscopy from Space: New Frontiers from Exoplanets to the Early Universe</i> (Caltech, Pasadena, USA)
July 2024	Organizer: “JWST+ALMA Workshop @ COSMOS Team Meeting”, COSMOS Team Meeting (Tokyo, Japan)
January 2021	Organizer: AAS #237 2-day Machine Learning Workshop (virtual, 120 attendees)
January 2020	Organizer: AAS #235 Machine Learning Workshop (Honolulu, USA, 80 attendees)

Professional Activities and Services

- **Lead of:** *(i)* IPAC Group “*Extragalactic and Early Universe Group (EEG)*”, connecting (visiting) graduate students, postdocs, and faculty/staff at Caltech/IPAC with interests in extragalactic science. *(ii)* Caltech galaxy formation journal club. *(iii)* IPAC Community and Communication (IPAC Com²) seminar series, which provides monthly interfaces for exchanging tips & tricks and ideas on topics related to science, software development, and administration (2023-2024). *(iv)* IPAC Visualization group, a think-tank for advanced data visualization in science, for public and scientific outreach. (2017-2020). *(v)* Pasadena Astro Postdoc Mixer at Caltech/IPAC (acquisition of funding and organization (2018-2020)).
- **Reviewer for:** *(i)* US National Science Foundation (NSF) AAG grants. *(ii)* Swiss National Science Foundation Advanced Grants (several \$1M grants awarded to support a research group at Swiss institutions). *(iii)* NASA Earth and Space Science Fellowship (NESSF) and the Future Investigators in NASA Earth and Space Science and Technology (FINESST) programs (\$45k awards to supplement graduate student's stipend for up to three years). *(iv)* various high-impact journals (ApJ, MNRAS, A&A, Nature Astronomy). *(v)* various telescope time allocation committees (JWST, ALMA, Hubble, Gemini).

- **Committee Member:** *(i)* IPAC visiting graduate student fellowship committee member. *(ii)* Caltech colloquium committee member (2018-2022). *(iii)* Search committee for Head of Science Staff at Caltech/IPAC (2022). *(iv)* Member of the Scientific Steering Committee for the COSMOS collaboration. *(v)* LOC and SOC member of several conferences in the past.
- **Science advisor and consultant:** *(i)* *The Science and Entertainment Exchange* (program of the National Academy of Science connecting entertainment industry professionals with top scientists and engineers to create a synergy between accurate science and engaging storylines in both film and TV programming). *(ii)* NASA's Community College Network (NCCN) where I am a subject matter expert and consultant for college teachers for physics and astronomy.

Outreach and Science Communication Activities

- **Public science talks:** more than 300 public talks including locations such as Griffith Observatory (reoccurring), Palomar Observatory, the California Dark Sky Festival (reoccurring), the Sequoia Dark Sky Festival, the Idaho star party, the Urania observatory Zürich (telescope demonstrator 2009-2015), and the Uitikon observatory Zürich (telescope demonstrator 2005-2015, still maintaining webpage).
- **Co-organizer** of the Caltech astronomy outreach program (public lectures and stargazing, sidewalk astronomy in Pasadena, Los Angeles astronomy on tap)
- **STEM panels and outreach:** *(i)* Various STEM outreach at primary and high schools in Los Angeles. *(ii)* STEM workshops related to JWST science in smaller schools in California and Alaska as part of the NCCN. *(iii)* involved in STEM programs for underrepresented minorities (e.g., FIELDS and WAVE fellowships at Caltech/JPL and other universities in southern California). *(iv)* NASA STEM career panel member (UCR, 2025), EESA STEM career panel member at John Muir High School (2021), AI workshop in Pakistan (2023).

In the Press

- **January 2026:** Caltech News story on the ALPINE-CRISTAL-JWST Survey (also covered 247th meeting of the *American Astronomical Society* on January 6, 2026): <https://www.caltech.edu/about/news/young-galaxies-grow-up-fast>
- **June 2025:** Interview at KTLA (Los Angeles and Southern California news TV broadcast) on the release of our COSMOS-Web JWST imaging (<https://ktla.com/video/caltech-scientist-helps-create-largest-map-of-the-universe/10787050/>). Also covered in Caltech/IPAC news story.
- **March 2023:** AAS Nova news article on JWST observations of globular clusters in the SMACS0723 galaxy cluster: <https://aasnova.org/2023/03/15/update-on-jwst-observations-of-galaxy-cluster-smacs-0723/>
- **October 2020:** ALMA/NRAO press release featuring ALPINE: <https://public.nrao.edu/news/galaxies-in-the-infant-universe-were-surprisingly-mature/>
- **April 2020:** Caltech News story on ALPINE: <http://pma.caltech.edu/news/rotating-galaxies-galore>