

Martin MILLON

PERSONAL DATA

ADDRESS: Stanford University | KIPAC
452 Lomita Mall, Room 228
Stanford, CA 94305-4085, USA

EMAIL: martin.millon@stanford.edu

RESEARCH INTEREST: Time-delay cosmology, Strong lensing, Microlensing, dark matter, dark energy

PUBLICATIONS: [ADS](#), [Google Scholar](#)

RESEARCH POSITION

2022-NOW SNSF Fellow, Kavli Institute for Particle Astrophysics and Cosmology (KIPAC), **Stanford University**

2021-2022 Postdoctoral Researcher, Laboratory of Astrophysics, **EPFL**

EDUCATION

2017-2021 Ph.D. in Observational Cosmology, Laboratory of Astrophysics, **EPFL**
PhD Thesis: "Time-delay Cosmography with Strongly Lensed Quasars"
Advisor: Prof. Frédéric COURBIN

2014-2016 Master of Science in APPLIED PHYSICS, **EPFL**
Master Thesis: "Source/lens separation: application to the Hubble Frontier Fields"
Advisor: Prof. Frédéric COURBIN

2013-2014 Third year of Bachelor in exchange, **Imperial College London**
Bachelor Thesis: "Dust in Local Galaxies from Herschel, Planck, ISO and IRAS"
Advisor: Dr. Dave CLEMENTS
Diploma awarded: Imperial College International Diploma

2011-2014 Bachelor of Science in PHYSICS, **EPFL**,

WORK EXPERIENCE

2015-2016 R&D Engineer Intern at **CSEM** (9 months), Basel
"Optimization and characterization of optical components for space instruments"
Conception and test of diffraction gratings developed for the European Space Agency

TEACHING EXPERIENCE

2023-2024 Introduction to observational astrophysics, seminar and workshop series.

Fall 2017-2021 Astrophysics Practical Work, PhD teaching assistant, (5 semesters)

Spring 2018-2020 Astrophysics I, PhD teaching assistant (3 semesters)

Spring 2016 General Physics IV, Student teaching assistant

Spring 2015 Physics laboratory work, Student teaching assistant

Fall 2014 General Physics I, Student teaching assistant

Spring 2013 General Physics II, Student teaching assistant

Fall 2012 General Physics I, Student teaching assistant

MENTORING

2024 - now	Jonathan Shoemaker , PhD Student, Stanford University
2023 - now	Padma Venkatraman , Postbac Student, Stanford University
2023 - now	Everett McArthur , Postbac Student, Stanford University
2022 - now	Sydney Erickson , PhD Student, Stanford University
Spring 2022	Kevin Michalewicz , Master thesis, Universidad de Buenos Aires & IMT Atlantique "High resolution deconvolution: an application to astrophysical imaging"
Spring 2021	Sophie Stucki , Semester thesis, EPFL "Studying Black Hole accretion disks with Convolutional Neural Networks"
Spring 2021	Yann Carteret , Semester thesis, EPFL "Measuring the Hubble Constant with lensed supernovae"
Spring 2020	Mark Maus , Semester thesis, EPFL "Measuring the Size of Quasar Accretion Disks Using Reverberation Mapping"
Spring 2020	Bastian Lengen , Semester thesis and summer internship, EPFL "Assessing the reliability of current curve-shifting techniques for time-delay cosmology"
Spring 2020	Soumiya Sheeram , Semester thesis, EPFL "Classifying the Source Radius from Microlensing Light Curves using Neural Networks"
2019 - 2020	Petra Awad , Specialization & Master thesis, EPFL "Improbability of Stellar Distributions as the Cause of Microlensing Signals for Gravitationally Lensed Quasars"
Spring 2019	Eric Paic , Master thesis, EPFL "Measurement of the radius of lensed quasar QJ0158-4325 using the power spectrum of the microlensing curve"
Spring 2019	Camille Arruat , semester thesis, EPFL "Measuring the size of black holes' accretion disks from Reverberation Mapping"
Spring 2018	Julien Dhur , high-school thesis, EPFL "Searching for quasars in the COSMOGRAIL monitoring data"
Spring 2018	Aymeric Galan Master thesis, EPFL "Assessing the reliability of strong lensing modeling tools for time-delay cosmography"

GRANT & AWARD

JUNE 2020	Swiss National Science Foundation (SNSF) Postdoc Mobility Fellowship "Time-delay cosmography in the LSST era". Research mobility grant at Stanford University.
OCT. 2016	Gilbert Hausmann Award Attributed for a Master project that stands out through its excellence, in the field of mechanical engineering, electrical engineering or physics. Prize: 5000 CHF

OBSERVING EXPERIENCE

2017-2022	Leonhard Euler 1.2m Swiss Telescope, La Silla, Chile, 57 nights Imaging of lensed quasars and spectroscopy for exoplanets research.
Apr. 2021	Nordic Optical Telescope, La Palma, Canary Islands, 2 nights Spectroscopic confirmation of newly discovered lensed quasars.
2017-2018	MPIA 2m2 telescope, La Silla, Chile, 9 nights Imaging of lensed quasars. 2 observing runs in total.
Nov. 2019	Vatican Advanced Technology Telescope, Mount Graham, USA, 2 nights Test imaging of lensed quasars.

SELECTED TALKS AND SEMINARS

- May 2024* ETHZ Cosmoclub, Zurich, Switzerland, invited talk (online).
“Cosmology with strong lensing : measuring the Hubble Constant with strongly lensed quasars.”
- Apr. 2024* CEFCA Seminar, Teruel, Spain, invited talk (online).
“Image deconvolution and light curve extraction with STARRED: an application to strong lensing cosmology.”
- Mar. 2024* Rubin Strong Lensing Workshop, Oxford, UK, contributed talk (online).
“Light-curve extraction and time-delay measurements for a large sample of lensed quasars”
- Feb. 2024* Boston University Cosmology Seminar, Boston, USA, invited talk.
“Cosmology with strong lensing : measuring the Hubble Constant with strongly lensed quasars”
- Feb. 2024* MIT Monday afternoon talks, Cambridge, USA, invited talk.
“Strong gravitational lensing by AGNs as a probe of the quasar–host relations in the distant Universe”
- Sept. 2023* KIPAC@20 conference, Stanford, USA, contributed talk.
“A rare case of strong lensing by a quasar”
- Aug. 2023* Lensing at different scales conference, Chicago, USA, invited review talk.
“Cosmology with strong lensing”
- June 2023* IAUS 381: Strong gravitational lensing in the era of Big Data, Otranto, Italy, contributed talk.
“Strong gravitational lensing by AGNs as a probe of the quasar–host relations in the distant Universe ”
- Apr. 2023* Stony Brook University seminar, New York, USA, invited talk.
“Measuring the Hubble Constant with strongly lensed quasar”
- Nov. 2022* University of Chicago open group seminar, Chicago, USA, invited talk (online).
“Zooming in on quasar accretion disks with gravitational microlensing”
- Oct. 2022* KIPAC Tea Talk, Stanford, USA, contributed talk.
“Zooming in on quasar accretion disks with gravitational microlensing”
- July 2022* ISSI workshop, Bern, Switzerland, invited talk .
“Evidence for a milliparsec-separation supermassive binary black hole with quasar microlensing”
- Sept. 2021* Lensing Odyssey conference, Kouremenos, Greece, invited talk.
“Extrinsic variability in strongly lensed quasars”
- Sept. 2021* USM lensing group seminar, Munich, Germany, invited talk (online).
“Time-delay cosmography with strongly lensed quasars”
- July 2021* IAS seminar, Paris, France, invited talk.
“Measuring the Hubble Constant with strongly lensed quasars”
- Mar. 2021* A (Hubble) tension headache, Online Conference, invited talk (online).
“Time-delay cosmography with Strongly Lensed quasars”
- Jan. 2021* Time-domain Cosmology with Strong Gravitational Lenses, Online Conference, contributed talk.
“The COSMOGRAIL project: past, on-going and future lensed quasars monitoring campaigns”
- Nov. 2019* KIPAC Tea Talk, Stanford, USA, invited talk.
“High-cadence monitoring for a precise measurement of the Hubble Constant”
- Feb. 2019* Cosmic Beacons workshop, Sexten, Italy, contributed talk.
“New strategies in lens monitoring for a precise measurement of the Hubble Constant”
- Sept. 2018* The Universe as a telescope (conference), Milan, Italy, contributed talk.
“Impact of the 3D source geometry on time-delay measurements of lensed type-Ia Supernovae”
- July 2018* The extragalactic distance ladder in the Gaia era (workshop), MIAPP, Munich, Germany, contributed talk.
“Lens monitoring and time-delay estimation for a one step measurement of H_0 ”
- June 2018* Research seminar, MPIA, Munich, Germany, invited talk.
“Impact of microlensing on the time-delay measurements of lensed quasars and Supernovae”

ACCEPTED OBSERVING PROPOSALS

<i>Jan. 2024</i>	VLT/X-SHOOTER proposal, PI: M. Millon “Spectroscopic confirmation of the first candidate lensed Supermassive Black Hole Binary”
<i>Jan. 2024</i>	VLT/ERIS proposal, Co-I, PI: F. Dux “High resolution imaging of southern lensed quasars with ERIS/NIX for time delay cosmography”
<i>May 2023</i>	James Webb Space Telescope Cycle 2 proposal, Co-I, PI: T. Treu “The Hubble constant at 1.9% from spatially resolved kinematics of gravitational lens”
<i>July 2022</i>	Hubble Space Telescope Cycle 30 proposal, Co-I, PI: C. Lemon “Time-delay Cosmography with Strongly Lensed Quasars: Doubles vs. Quads”
<i>Sept. 2021</i>	NTT/EFOSC2 proposal, Co-I, PI: C. Lemon “Exploring optical quasar variability from intraday to monthly rest-frame timescales”
<i>July 2021</i>	Chandra Cycle 23 proposal, Co-I, PI: D. Pooley. “Nano-arcsecond Tomography of the Central Regions of the Quasar in SDSS J0924+0219”
<i>Sept. 2020</i>	Subaru-FOCAS proposal, Co-I, PI: K. Wong. “Spectroscopy of Lensed Quasars for Time-Delay Cosmography”
<i>Sept. 2020</i>	NOT-ALFOSC proposal, Co-I, PI: C. Lemon. “Spectroscopic Confirmation of Northern Lensed Quasars”
<i>April 2020</i>	VLT-MUSE proposal, Co-I, PI: A. Agnello. “Two percent uncertainties in the Hubble constant with lensed quasars and MUSE-WFM”
<i>March 2020</i>	LCO Key Projects proposal, Co-I, PI: C-F. Chen. “High-cadence Lens Monitoring for Time-Delay Cosmography”
<i>Sept. 2019</i>	VLT-MUSE and VLT-FORS2 proposal, Co-I, PI: D. Sluse. “Environment of time-delay lensed quasars monitored at ESO for high accuracy cosmography”
<i>April 2019</i>	NOT-ALFOSC proposal, Co-I, PI: C. Lemon. “Spectroscopic Confirmation of the Brightest Lensed Quasars in the North”
<i>Sept. 2018</i>	VST-OMEGACAM proposal, Co-I, PI: F. Courbin. “High-cadence Lens Monitoring for Time Delay Cosmography”

PUBLIC OUTREACH

<i>June 2023</i>	EPFL and KIPAC press releases “How to precisely weigh a quasar’s host galaxy”
<i>May. 2023</i>	Public observations, Stanford University
<i>Apr. 2023</i>	KIPAC Community Day, Stanford University
<i>2017-2022</i>	Public tours/Public observation, Observatory of Geneva
<i>Nov. 2020</i>	SLAC/Stanford press release “Gravitational lenses could hold the key to better estimates of the expansion of the universe”
<i>July 2020</i>	Participation to the HoLiCOW outreach Youtube video
<i>Jan. 2020</i>	EPFL/HST press release “Cosmic magnifying glasses show faster expanding universe”
<i>Sept. 2019</i>	Esprit sorcier, participation in a science TV show, EPFL
<i>Sept. 2019</i>	EPFL Open-days, demonstrator, EPFL
<i>Nov. 2018</i>	Journée des Métiers, demonstrator, Palexpo, Geneva

COMMUNITY SERVICES

Journal referee: Nature, A&A, ApJ, MNRAS, JCAP

Collaboration memberships: TDCOSMO, COSMOGRAIL, HoLiCOW, STRIDES, LSST Strong Lensing Science Collaboration, LSST Dark Energy Science Collaboration, DESI


OTHER TECHNICAL SKILLS


Programming languages: Python, C++, PHP, \LaTeX

Astronomical softwares: SExtractor, Lenstronomy

Other frameworks/softwares: Keras/TensorFlow, JAX

Other skills: Software Development, cluster computing

Lead developer of the deconvolution Python package STARRED 

Lead developer of the time-delay measurement Python package PyCS3 

Contributing developer for the lens modelling software LENSTRONOMY 