

Cristóbal Sifón

Profesor Auxiliar

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<https://github.com/cristobal-sifon/>

Research Interests

My research focuses on galaxy cluster physics including observable–mass scaling relations for cosmological analyses, brightest cluster galaxies, the mass content of cluster galaxies, and merging clusters. I am also interested in intrinsic galaxy alignments, both as contaminants for cosmic shear and as a physical mechanism in their own right. I use various tools and techniques to study these phenomena, including weak gravitational lensing, spectroscopy, the exploitation of optical surveys in general, and most recently also of hydrodynamical simulations.

Collaborations: 4MOST Chilean Cluster Galaxy Evolution Survey (CHANCES) — 4MOST Hemisphere Survey (4HS) — Atacama Cosmology Telescope (ACT) — Canadian Cluster Comparison Project (CCCP) — Galaxy Cluster Mass Reconstruction Project — Kilo-Degree Survey (KiDS) — Legacy Survey of Space and Time Dark Energy Science Collaboration (LSST-DESC) — Multi-Epoch Nearby Cluster Survey (MENeCS) — Simons Observatory.

Employment

[2022 – Present] Profesor Auxiliar, Pontificia Universidad Católica de Valparaíso (PUCV), Chile

[2019 – 2022] Profesor Asociado, PUCV

[2016 – 2019] Postdoctoral Research Associate, Princeton University, USA

Education

[2012 – 2016] Ph.D. Astrophysics, Universiteit Leiden, The Netherlands

[2010 – 2012] M.Sc. Astrophysics, P. Universidad Católica de Chile (PUC), Chile

[2005 – 2010] B.Sc. Astronomy, PUC

Teaching & Mentoring

Graduate Research Mentoring

[2023 – Present] Javier Urrutia, PUCV: MSc thesis advisor.

[2020 – 2022] Camila Aros, PUCV: MSc thesis advisor.

[2017 – 2019] Naomi Robertson, Oxford University (UK): co-advised PhD thesis project (Advisor: Joanna Dunkley).

[2013 – 2014] Joshua Albert, Universiteit Leiden: co-advised MSc thesis project (Advisor: Huub Röttgering).

Undergraduate Research Mentoring

[2022] Pablo Garrido, PUCV: Undergraduate Senior thesis.

[2021] Lya Marmolejo, PUCV: Undergraduate summer research project (USRP) and Senior thesis.

[2020] Nicole Mejía, Universidad Nacional Autónoma de Honduras (Honduras): Four-month undergraduate research project through the Central American-Caribbean Bridge in Astrophysics Program ([URL](#)).

[2020] Felipe Jorquera, PUCV: USRP.

[2018] Malik Walker, Princeton University: USRP and Junior Project.

Courses Taught

Graduate: Data Analysis (2023), Techniques of Observational Astrophysics (2022), Observational Cosmology (2020-2021)

Undergraduate: Astronomical Instrumentation (2023), Galactic Astronomy (2021-2022), Programming (2020-2022), Cosmology (2020)

Non-astrophysics major: Basic Astronomy for Engineers (2022)

Grants

[2020] ALMA-ANID Fund to hire a postdoc (**Co-PI**, 2 years, US\$77,000)

[2019] FONDECYT Iniciación research grant (**PI**, 3 years, US\$125,000)

Successful Observing Proposals (as PI)

I have been the PI of 12 successful observing proposals totalling hundreds of observing hours in optical (Gemini-South/GMOS, VST/OmegaCAM), near-infrared (Magellan/Fourstar), submm (APEX/CONCERTO), and radio (GMRT, VLA) telescopes.

Observing Experience: I have spent roughly 180 hours observing with optical (Gemini South/GMOS) and near-infrared (NTT/SofI, Magellan/Fourstar) instruments performing both imaging and spectroscopy of galaxy clusters.

Community Activity

Journals: I have served as a referee for Astronomy & Astrophysics, The Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, and Nature Astronomy.

Telescope Allocation Committees (TACs): I have served as a reviewer for the Canadian and Swiss National Foundation TACs, as well as for the *Chandra* X-ray Observatory.

Informal courses

[2016] *Making Better Figures*, Universiteit Leiden (see [here](#))

Press articles authored

[July 2017] *Galaxy clusters: Falling into line* (Nature Astronomy News & Views)

[July 2013] *Featured Science: Dynamical masses of galaxy clusters discovered with the Sunyaev-Zel'dovich effect* (Gemini Focus)

Outreach

[2022] Interview for Radio Valentín Letelier, Valparaíso, to talk about CHANCES.

[2021] Online public talk in the context of the Chilean *Day of Astronomy*.

[2018 – 2019] Assisted with *Public Astronomical Observations in Spanish*, Princeton University.

[2013 – 2014] Assisted with *Public Observations at the Old Observatory*, Leiden Observatory.

[2012] Co-taught an *Astronomy Course for Seniors*, PUC.

[2011] Participated in *Starry Nights*, observation nights for elementary and middle school students in social risk organized by ESO-Santiago.

[2010] Invited talk on board the “FFG14 Almirante Latorre” Chilean Navy ship, Valparaíso, Chile.

[2010] *The Universe*, a series of talks for elementary school students in social risk organized by PUC.

Technical skills

I am an experienced python programmer, and I also have some experience with IRAF/PyRAF. I have written pygmos, a Python/PyRAF pipeline to reduce Gemini-GMOS spectra which is available [here](#). I also developed

an early analysis pipeline for the FLAMINGOS-II infrared imager and spectrograph installed in the Gemini-South telescope. I am one of three lead developers and maintainers of the galaxy-galaxy lensing pipeline used by the KiDS collaboration (written in python, but which is not public at the moment). Other codes I have written are posted at my [github](#) page.

Other Work Experience

[2007 – 2008] Ski instructor at Homewood Mountain Ski Resort in Lake Tahoe, CA. Obtained certification as *Level I Ski Instructor* by the Professional Ski Instructors of America (PSIA).

[2006 – 2007] Ski lift operator at Sun Valley Resort, Sun Valley, ID.

References

- Prof. Henk Hoekstra (*PhD advisor*)
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