

# Cristóbal Sifón

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

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## 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 analyses involving hydrodynamical simulations.

**Collaborations:** Atacama Cosmology Telescope (ACT) — Canadian Cluster Comparison Project (CCCP) — Galaxy Cluster Mass Reconstruction Project — Hyper-Suprime Cam survey (HSC) — Kilo-Degree Survey (KiDS) — Large Synoptic Survey Telescope Dark Energy Science Collaboration (LSST-DESC) — Multi-Epoch Nearby Cluster Survey (MENeCS) — Simons Observatory.

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## Employment

[2019 – Present] Profesor Asociado, Pontificia Universidad Católica de Valparaíso (PUCV), Chile  
[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, P. Universidad Católica de Chile, Chile

## Internships

[2011] Science Intern, Gemini South Observatory (6 months)  
[2011] Internship, Rutgers University (2 months)  
[2009] Science Intern, Gemini South Observatory (6 months, *B.Sc. thesis*)

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## Teaching & Mentoring

### Student Research Mentoring

[2017 – 2019] Naomi Robertson, Oxford University (UK): co-advised PhD thesis project.  
[2018] Malik Walker, Princeton University: Undergraduate Summer Research Program and Junior Project.  
[2013 – 2014] Joshua Albert, Universiteit Leiden: co-advised MSc thesis project.

### Teaching Assistant

[Leiden] Stellar dynamics; organizer of MSc thesis defense presentations  
[PUC] Extragalactic astrophysics; Experimental astrophysics; Laboratory of thermodynamics and kinetic theory

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## Grants

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

### Successful Observing Proposals (as PI)

I have been the PI of 7 different successful observing proposals in 5 different telescopes:

[Magellan/FourStar] (2019A,2019B) 2 nights for near-infrared imaging of galaxy clusters

[Very Large Array] (2019A) 4.5 h to study AGN feedback in galaxy clusters

[Giant Metrewave Radio Telescope] (2017B,2013B) 44 h to study diffuse radio emission in clusters

[Gemini South/GMOS] (2017B) 24 h for optical imaging and spectroscopy of high-redshift galaxy clusters

[VLT Survey Telescope/OmegaCAM] (2015A) 6 h for optical imaging of galaxy clusters

**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.

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## Community Activity

I have served as a referee for Astronomy & Astrophysics, The Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, and Nature Astronomy, as well as for the Canadian Telescope Allocation Committee.

### Informal courses

[2016] *Making Better Figures*, Universiteit Leiden (<http://bit.ly/2NTznxW>)

### Press articles authored

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

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

### Outreach

[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.

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## 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.

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## 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.

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## References

- Prof. Henk Hoekstra (*PhD advisor*)  
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