

# Cristóbal Sifón

Profesor Asociado  
Instituto de Física, Facultad de Ciencias  
Pontificia Universidad Católica de Valparaíso  
Casilla 4059, Valparaíso, Chile

E-mail: [cristobal.sifon@pucv.cl](mailto:cristobal.sifon@pucv.cl)  
Phone: +56 (32) 227 4698  
<http://www.astro.princeton.edu/~sifon/>  
<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 — 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 (Assistant Professor), 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

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

[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.

### Courses Taught

[2020B] Observational Cosmology (graduate level, PUCV)

## 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 9 different successful observing proposals in 5 different telescopes:

[Magellan/FourStar] (2020AB,2019AB) 6 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*)  
Leiden Observatory, Universiteit Leiden  
Niels Bohrweg 2, NL-2333 CA Leiden, The Netherlands  
Phone: +31 (71) 527 5594  
E-mail: [hoekstra@strw.leidenuniv.nl](mailto:hoekstra@strw.leidenuniv.nl)
  - Prof. David N. Spergel  
Center for Computational Astrophysics, Flatiron Institute  
160 Fifth Avenue, 7th Floor, New York, NY 10010, USA  
Phone: +1 (646) 654 0066  
E-mail: [dns@astro.princeton.edu](mailto:dns@astro.princeton.edu)
  - Prof. John P. Hughes  
Department of Physics and Astronomy, Rutgers University  
136 Frelinghuysen Rd., Piscataway, NJ 08854, USA  
Phone: +1 (848) 445 8878  
E-mail: [jph@physics.rutgers.edu](mailto:jph@physics.rutgers.edu)
  - Prof. L. Felipe Barrientos (*MSc advisor*)  
Instituto de Astrofísica, P. Universidad Católica de Chile  
Casilla 306, Santiago 22, Chile  
Phone: +56 (2) 2354 4941  
E-mail: [barrientos@astro.uc.cl](mailto:barrientos@astro.uc.cl)
  - Prof. Felipe Menanteau  
Department of Astronomy, University of Illinois at Urbana-Champaign  
1002 W. Green St., Urbana, IL 61801, USA  
Phone: +1 (217) 244 6297  
E-mail: [felipe@illinois.edu](mailto:felipe@illinois.edu)
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