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Matías Carrasco Kind

Education

- 2010 – 2014 **Ph.D., Astrophysics**, Department of Astronomy, University of Illinois at Urbana-Champaign (UIUC), IL, USA .
with Computational Science and Engineering (CSE) graduate option
- Thesis title *"Probabilistic Photometric Redshifts in the era of Petascale Astronomy"*, Advisor: Prof. Dr. Robert Brunner (UIUC)
- 2011 **M.S., Astrophysics**, University of Illinois at Urbana-Champaign (UIUC), IL, USA.
- 2006 – 2008 **Ph.D. candidate**, Ludwig-Maximilians Universität, München, Germany, Program carried out through the International Max-Planck Research School (IMPRS) at Max-Planck Institute for Astrophysics (MPA), Garching, Germany.
- Thesis title *"Large-scale structure in the galaxy distribution"*, Advisors: Prof. Dr. S.D.M. White (MPA), Dr. G. Kauffmann (MPA)
- 2006 **B.S., Astronomy (5 years program)**, Pontificia Universidad Católica de Chile (PUC), Santiago, Chile, summa cum laude.
Thesis carried out at Max-Planck Institute for Astrophysics (MPA), Garching, Germany
- Thesis title *"Environmental dependence of Dark Matter Halos properties in a Λ CDM Universe"*, Advisors: Prof. Dr. S.D.M. White (MPA), Dr. Felipe Barrientos (PUC)

Positions

- 2020 – present **Assistant Director**, Data Science Research Services, Gies College of Business, UIUC, IL, USA.
- 2019 – present **Research Assistant Professor**, Department of Astronomy, UIUC, IL, USA.
- 2018 – present **Senior Research Scientist**, National Center for Supercomputing Applications (NCSA), UIUC, IL, USA.
- 2014 – 2017 **Research Scientist**, National Center for Supercomputing Applications (NCSA), UIUC, IL, USA.
- 2008–2010 **Adjunct Professor**, Universidad Andres Bello (UNAB), Santiago, Chile.
- 2008–2010 **Research Scientist**, Universidad Andres Bello (UNAB), Santiago, Chile.
- 2006–2008 **Graduate student (as IMPRS PhD student)**, MPA, Garching, Germany.
- 2006 **LENAC/ALFA visitor**, Max Planck Institute for Astrophysics (MPA).

Languages

- Spanish Native
- English Fluent, written and spoken
- German Written (basic), spoken (intermediate level)

Experience

Teaching and educational experience

- 2020 **1 Graduate and 6 Undergraduate advisor**, Research projects, UIUC, USA.
- 2019 **1 Graduate and 5 Undergraduate advisor**, Research projects, UIUC, USA.
Invited Lecturer, Astrophysical Seminar, UIUC, USA.
- 2018 **2 Graduate and 4 Undergraduate advisor**, Research projects, UIUC, USA.
- 2017 **2 Graduate and 4 Undergraduate advisor**, Research projects, UIUC, USA.
- 2016 **SPIN (Students Pushing INnovations) Mentor**, NCSA, UIUC, USA.
3 Graduate and 4 Undergraduate advisor, Research projects, UIUC, USA.
- 2015 **SPIN Mentor**, NCSA, UIUC, USA.
2 Graduate and 2 Undergraduate advisor, Research projects, UIUC, USA.
- 2014 **SPIN Mentor**, NCSA, UIUC, USA.
NSF POP (Passionate On Parallel) REU (Research Experience for Undergraduates) Mentor, UIUC, USA.
Google Summer of Code Mentor, For the LCDM organization at UIUC, Google, CA.
1 Graduate and 2 Undergraduate advisor, Research projects, UIUC, USA.
- 2010–2013 **Co-organizer**, of the weekly Cosmology Journal club, UIUC.
- 2011 **Laboratory Teaching Assistantship**, ASTR132: Stars and Galaxies Lab, UIUC, USA.
Teaching Assistantship, ASTR122: Stars and Galaxies, UIUC, USA.
- 2010 **Teaching Assistantship**, ASTR404: Stellar Astrophysics, UIUC, USA.
- 2010 **Instructor**, FMF023: Introduction to Physics, FMF122: Classical Mechanics and FMF241: Electromagnetism for Physics and Civil Engineering, UNAB, Chile.
Instructor, FMF120: Acoustic Physics for Phonoaudiology, UNAB, Chile.
Book Reviewer and Scientific Advisor, for "Química 4", ed. Santillana, a High-School Chemistry book, Santiago, Chile.
- 2010.summer **Instructor**, FMF122: Classical Mechanics for Civil Engineering, UNAB, Chile.
- 2009 **Instructor**, FMF023: Introduction to Physics, FMF122: Classical Mechanics and FMF241: Electromagnetism for Physics and Civil Engineering, UNAB, Chile.
Instructor, FMF019: Physics for Medicine, UNAB, Chile.
Book Reviewer and Chapter Co-Author, for "Física 3", ed. Santillana, a High-School physics book, Santiago, Chile.
- 2009 **Instructor**, FMF023: Introduction to Physics, FMF122: Classical Mechanics and FMF241: Electromagnetism for Physics and Civil Engineering, UNAB, Chile.
- 2008 **Instructor**, FMF122: Classical Mechanics for Civil Engineering, UNAB, Chile.
Instructor, FMF019: Physics for Medicine, UNAB, Chile.
Lab Graduate T.A., Two laboratory courses (Mechanics and Waves and Heat), PUC.
- 2007 **Organizer and participant**, of the weekly students Journal Club, MPA.
Organizer and participant of Computational Seminar, MPA
- 2006–2007 Two talks given to graduate students as part of the IMPRS Seminar, MPA
- 2002 – 2005 **Undergraduate T.A.**, 8 teaching assistantships, Contemporary Physics, Electromagnetism (x3), Advanced Mathematical Methods of Physics, Mechanics, General Astrophysics, Modern Physics, PUC.

Lab Undergraduate T.A., 8 laboratory teaching assistantship, PUC.

2004–2005 **Undergraduate T.A.**, 5 teaching assistantships program PENTA UC (aimed for high-talented high/mid school students from public schools of Santiago) in the courses: Physics in Nature (x2), Programming numerical problems, Physics of Sport and Math and Logic, PUC.

Computer programming experience

OS Unix, Linux, OS X
Languages Python, IDL, C/C++, Fortran, Go, Shell, HTML, CSS, Javascript, PL/SQL, L^AT_EX
Others HPC, Condor, Hadoop, Spark, Flask/Tornado, Docker containers, Web components, MongoDB/SQL, Kubernetes, Cloud computing

Other professional experience

2020 **Snowmass 2021 Co-Convener**, Computational Frontier *Reinterpretation and long-term preservation of data and code* convener, USA.
Program Committee, 1st Deep Learning Theory and Applications Conference, France.
Program Committee, Gateways 2020 Conference, USA.

2018 – current **Data Release Scientist**, Dark Energy Survey, USA.

2018 **LOC/SOC co-chair**, Data Visualization and Exploration in the LSST Era, NCSA, Urbana, IL, USA, June 19.

2017 – 2018 **Science Release Working Group chair**, Dark Energy Survey, USA.

2017 **LOC**, DES Chicagoland meeting, NCSA, Urbana, IL, USA, October 3.

2016 **SOC**, LSST photo-z Workshop, University of Pittsburgh, Pennsylvania, PA, USA, April 5-7.

2015 **LOC**, DES Chicagoland meeting, NCSA, Urbana, IL, USA, December 10.

Other **Referee for Journal of Open Source Software**, JOSS.
Referee for Computer Science journal, PeerJ Computer Science, PeerJ.
Referee for Nature Astronomy, Nature, Nature Publishing Group.
Referee for Fondecyt (Chilean National Funds for Scientific and Technological Development), Government of Chile.
Referee for instrumentation journal, Sensors, MDPI.
Referee for astronomical journals, ApJ (IOP Publishing for the AAS), MNRAS (Oxford University Press), Astronomy & Computing (Elsevier), Experimental Astronomy (Springer), Astronomy & Astrophysics (Springer).

Scholarships and Honours

2019 **National Academy of Sciences, Space Studies Board Panelist for Big Data**, National Academy of Sciences, USA.
Trusted CI Open Science Cybersecurity Fellowship, NSF Cybersecurity Center of Excellence, NSF, USA.

2015 **Outstanding Contribution Award**, NCSA, IL, USA.

2013 **Junior scientist award to attend the DES International Collaboration meeting**, LBNL, CA, USA.

2012 **Financial aid award to attend**, ADASS-XXII, UIUC, Champaign-Urbana, USA.

2011–2013 **Computational Science and Engineering Fellowship**, UIUC, Urbana, USA.

2011 **Love of Learning Award**, Phi Kappa Phi honor Society, UIUC Chapter.

- 2011 **Phi Kappa Phi Honor Society Membership**, UIUC, Urbana-Champaign, IL, USA.
- 2009 **Beca Chile**, Merit-based scholarship given by the Chilean government for abroad PhD studies (Awarded but declined), CONICYT, Chile.
- 2006–2008 **IMPRS PhD fellowship**, from the International Max-Planck Research School in Astrophysics, MPA.
- 2007 **Grant from Universidad Católica**, for attending the SCS PIRE Summer School on the Large Scale Structure-CMB connection, Santiago, Chile.
- 2006 **Marie Curie Host Fellowship for Early Stage Research Training**, (4 months), MPA.
Grant from LENAC Network for attending the XIII IAGUSP Advanced School of Astrophysics and the LENAC special session, Foz do Iguazu, Brazil
Undergraduate Summa cum laude at PUC
- 2006 **ALFA/LENAC programme fellowship**, at Max-Planck Institut für Astrophysik, January to June. Fellowship given to exceptional Latin-americans students through the LENAC Network under the ALFA program to complete a research training project in Europe, MPA-PUC.
Summer school fellowship at Observatory UC from Universidad Católica
- 2002–2003 **FEUC scholarship**, Given by the Universidad Católica's student government for academic excellence in order to finance part of the annual university debt, PUC.

Selected Seminars, Schools and Conferences

- 2020 • **Frontier Development Lab: Big Think**, NASA AMES Research Center, CA, Jan 30, invited talk.
- 2019 • **CHPC National Conference**, Boksburg, South Africa, Dec 2 – 5, invited keynote.
• **National Academy of Sciences, Space Studies Board Meeting, Maximizing Scientific Outcome with Big Data**, Irvine, CA, Nov 6 – 7, invited talk and panelist.
• **Laboratório Interinstitucional de e-Astronomia(LIneA) Seminar**, Rio de Janeiro, Brasil, Oct 10, invited webinar talk.
• **NCSA Industry Conference**, NCSA, Urbana, IL, Oct 9 – 10, invited talk.
• **Gateways 2019**, Science Gateways Community Institute, San Diego, CA, Sep 23 – 25, contributed talk.
• **Practice and Experience in Advanced Research Computing (PEARC 19)**, Chicago, IL, July 28 – 31, contributed to panel.
• **DES international collaboration meeting**, UPenn, Philadelphia, PA, June 17 – 21, contributed talks.
• **Artificial Intelligence for Data Discovery and Reuse**, CMU, Pittsburgh, PA, May 13 – 15, contributed talk.
• **UIUC Astrofest**, Urbana, IL, April 23rd, contributed talk.
- 2018 • **Kubecon 2018**, Seattle, WA, December 10 – 14.
• **AstroData2020s Science Workshop**, Caltech/IPAC, CA, USA, Dec 4 – 7, invited talk.
• **DES international collaboration meeting**, Campinas, Brazil, Dec 3 – 7, contributed talk.
• **Laboratório Interinstitucional de e-Astronomia(LIneA) Seminar**, Rio de Janeiro, Brasil, Oct 10, invited webinar talk.
• **Near-Field Cosmology with the Dark Energy Survey's DR1 and Beyond**, University of Chicago, USA, June 27 – 29, invited talk.

- **Data Visualization and Exploration in the LSST Era**, Urbana, IL, June 19 – 21, contributed talks.
 - **9th Workshop on Scientific Cloud Computing**, Tempe, AZ, June 11 – 14, contributed talk.
 - **DES international collaboration meeting**, Texas A&M University, USA, May 14 – 18, contributed talk and session.
 - **Science Platforms/Server-Side Analytics Workshop**, STScI, Baltimore, MD, February 26 – 28, invited talk.
 - **American Astronomical Society 231st meeting**, Washington, DC, January 8 – 12, DES DR1 release talk, DES special session.
- 2017
- **Kubecon 2017**, Austin, TX, December 6 – 8.
 - **Dark Energy Survey Chicagoland Meeting**, NCSA, Urbana, IL, October 3, contributed talk, LOC.
 - **National Data Service Container Workshop**, NCSA, Urbana, IL, August 17 – 18, invited talk.
 - **DES international collaboration meeting**, University of Chicago, USA, June 12 – 16, contributed talks and demo.
 - **Detecting the Unexpected**, Discovery in the Era of Astronomically Big Data, Space Telescope Science Institute, Baltimore, MD, February 27 – March 2, contributed invited talk and demo.
 - **American Astronomical Society 229rd meeting**, Grapevine, TX, January 3 – 7, contributed poster.
- 2016
- **DES international collaboration meeting**, University of Cambridge, UK, December 12 – 16, contributed talk.
 - **Kubecon 2016**, Seattle, WA, November 8 – 9.
 - **University of Chicago/KICP guest lecturer**, Chicago, IL, October 14, invited lecture.
 - **CEFCA Seminar**, CEFCA, Teruel, Spain, October 13, invited webtalk.
 - **Dark Energy Survey Chicagoland Meeting**, Argonne National Lab, Lemont, IL, August 30, contributed talk.
 - **DES international collaboration meeting**, SLAC National Accelerator Laboratory, CA, May 9 – 13, contributed talk and tutorial.
 - **LSST photo-z Workshop**, University of Pittsburgh, Pennsylvania, PA, April 5, contributed talk.
 - **LSST Tech Talk**, LSST, March 22, contributed webtalk.
- 2015
- **Dark Energy Survey Chicagoland Meeting**, NCSA, Urbana, IL, December 10, contributed talk, LOC.
 - **Nebula Openstack users meeting**, NCSA, Urbana, IL, November 11, contributed talk.
 - **LSST Dark Energy Science Collaboration meeting**, Argonne National Lab, Lemont, IL, October 27 – 30, contributed talk.
 - **Dark Energy Survey Chicagoland Meeting**, University of Chicago, IL, September 9, contributed tutorial.
 - **DES international collaboration meeting**, University of Michigan, Ann Arbor, MI, May, 11 – 15, contributed talk and tutorial.
 - **Tools for Astronomical Big Data**, NOAO, Tucson, AZ, March 9 – 11, contributed talk.
 - **DECam Community Science Workshop**, NOAO, Tucson, AZ, March 11 – 13, contributed talk.

- **Dark Energy Survey Chicagoland Meeting**, Fermilab, Batavia, IL, February 23, contributed tutorial.
- 2014 • **Dark Energy Survey Chicagoland Meeting**, Argonne National Laboratory, Lemont, IL, December 9, contributed talk.
- **Google Summer of Code summit**, San Jose, CA, October 23 – 26.
- **LSST Dark Energy Science Collaboration meeting**, Philadelphia, PA, June 17 – 19, contributed talk.
- **Big Data Workshop**, UIUC, Computational Science and Engineering department, Urbana, May, 28 – 30, invited tutorial/talk.
- **DES international collaboration meeting**, UIUC/NCSA, Urbana, May, 19 – 23, contributed talk.
- **Laboratório Interinstitucional de e-Astronomia(LIneA) Seminar**, Rio de Janeiro, Brasil, May 8, invited webinar talk.
- 2013 • **LSST Dark Energy Science Collaboration meeting**, Pittsburgh, PA, Dec 3 – 6, 2 contributed talks.
- **46th Annual Fermilab Users Meeting**, Fermilab, Batavia, IL, June 12 – 13, contributed talk on behalf Dark Energy Survey.
- **American Astronomical Society 222rd meeting**, Indianapolis, Indiana, June 3 – 6, contributed poster.
- **Computational Science and Engineering Annual Meeting**, UIUC, April, 24 – 25, contributed talk and poster.
- **DES international collaboration meeting**, LBNL, Berkeley, California, April, 8 – 12, 3 contributed talks.
- 2012 • **Universidad Catolica de Chile Seminar**, PUC, Santiago, Chile, December 6, invited talk.
- **CTIO Scientific colloquia**, invited NOAO South Visiting Astronomer, CTIO, La Serena, Chile, December 3, invited talk.
- **Astronomical Data Analysis Software and Systems ADASS-XXII**, UIUC, November 4 – 8, contributed talk.
- **Computational Science and Engineering Annual Research Symposium**, UIUC, April, 24, contributed talk.
- 2009 • **SOCHIAS meeting**, Chilean Astronomical Society, Santiago, January, 14 – 16.
- 2008 • **"The Galaxy and its stellar halo: insights on their formation from a hybrid cosmological approach"**, MPA, May, 26.
- **IMPRS seminar**, Max-Planck Institut für Astrophysik, January 22, contributed talk.
- 2007 • **"Modern theories of galaxy formation: methods, aims and limits"**, Max-Planck Institut für extraterrestrische Physik, MPE, Garching, Germany, November 22.
- **"Building Mock catalogues of galaxies"**, Max-Planck Institut für extraterrestrische Physik, October 12, contributed talk.
- **IMPRS seminar**, Max-Planck Institut für Astrophysik, June 21, contributed talk.
- **"The impact of AGN feedback on galaxy formation: theoretical modeling and observational signatures"**, Ringberg Castle, Germany, May 20-26.
- **"SCS PIRE Summer School on the Large Scale Structure-CMB connection"**, Universidad Católica de Chile (PUC), March 19, contributed poster.
- 2006 • **"Studying galaxy formation and evolution with semi-analytic models"**, MPA, March 11.

- "XIII IAGUSP Advanced School of Astrophysics and the LENAC special session", Foz do Iguazu, Brasil, April 6, [contributed talk](#).
- 2005 • **Latin American Astronomy School**, ESO, Chile, December, 8-10, [contributed poster](#).

Publications

All Publications

Metrics [publications](#): 269, [citations](#): >10,000, [h-index](#): 49, [i10-index](#): 159

Links [ADS link to all publications](#), [Google Scholar Profile](#)

Selected publications

- Brandon Buncher, **Matias Carrasco Kind**, "*Probabilistic cosmic web classification using fast-generated training data*", [arXiv e-prints:1912.04412](#) (2019)
- **M. Carrasco Kind**, Alex Drlica-Wagner, Audrey Koziol, Don Petravick, "*easyaccess: Enhanced SQL command line interpreter for astronomical surveys*", [The Journal of Open Source Software](#), 4:1022 (2019)
- **M. Carrasco Kind**, "*Searching for similarities and anomalies in a pool of galaxy images*", [Artificial Intelligence for Data Discovery and Reuse](#), (2019)
- **Matias Carrasco Kind**, Alex Drlica-Wagner, Audrey Koziol, "*easyaccess: SQL command line interpreter for astronomical surveys*", [Astrophysics Source Code Library:1812.008](#) (2018)
- Sahand Hariri, **Matias Carrasco Kind**, RobertJ. Brunner, "*Extended Isolation Forest*", [arXiv e-prints:1811.02141](#), [IEEE Transactions on Knowledge and Data Engineering](#) (2018)
- E. Morganson, R. A. Gruendl, F. Menanteau, **M. Carrasco Kind**, Y.-C. Chen, et al., "*The Dark Energy Survey Image Processing Pipeline*", [PASP](#), 130:074501 (2018)
- **Matias Carrasco Kind**, "*The Dark Energy Survey First Data Release*", [American Astronomical Society Meeting Abstracts #231:None](#) (2018)
- S. Hariri, **M. Carrasco Kind**, "*Batch and Online Anomaly Detection for Scientific Applications in a Kubernetes Environment*", [Proceedings of the 9th Workshop on Scientific Cloud Computing](#), (2018)
- W. Yu, **M. Carrasco Kind**, R. J. Brunner, "*Vizic: A Jupyter-based interactive visualization tool for astronomical catalogs*", [Astronomy and Computing](#), 20:128-139 (2017)
- Weixiang Yu, **Matias Carrasco Kind**, Robert Brunner, "*A Jupyter-based Interactive Visualization Tool for Astronomical Catalogs*", [American Astronomical Society Meeting Abstracts #229:None](#) (2017)
- Weixiang Yu, **M. Carrasco Kind**, RobertJ. Brunner, "*Vizic: Jupyter-based interactive visualization tool for astronomical catalogs*", [Astrophysics Source Code Library:1701.002](#) (2017)
- J. Asorey, **M. Carrasco Kind**, I. Sevilla-Noarbe, R. J. Brunner, J. Thaler, "*Galaxy clustering with photometric surveys using PDF redshift information*", [MNRAS](#), 459:1293-1309 (2016)
- **Matias Carrasco Kind**, R. J. Brunner, "*SparsePZ: Sparse Representation of Photometric Redshift PDFs*", [Astrophysics Source Code Library:1511.011](#) (2015)
- Edward J. Kim, Robert J. Brunner, **Matias Carrasco Kind**, "*A hybrid ensemble learning approach to star-galaxy classification*", [MNRAS](#), 453:507-521 (2015)

- **Matias Carrasco Kind**, “*Probabilistic Photometric Redshifts In The Era Of Petascale Astronomy*”, [PhD Thesis](#) (2015)
- C. Sánchez, **M. Carrasco Kind**, H. Lin, R. Miquel, F. B. Abdalla, et al., “*Photometric redshift analysis in the Dark Energy Survey Science Verification data*”, [MNRAS](#), **445:1482-1506** (2014)
- **Matias Carrasco Kind**, RobertJ. Brunner, “*Exhausting the information: novel Bayesian combination of photometric redshift PDFs*”, [MNRAS](#), **442:3380-3399** (2014)
- **Matias Carrasco Kind**, RobertJ. Brunner, “*Sparse representation of photometric redshift probability density functions: preparing for petascale astronomy*”, [MNRAS](#), **441:3550-3561** (2014)
- **Matias Carrasco Kind**, Robert Brunner, “*MLZ: Machine Learning for photo-Z*”, [Astrophysics Source Code Library:1403.003](#) (2014)
- **Matias Carrasco Kind**, Robert J. Brunner, “*SOMz: photometric redshift PDFs with self-organizing maps and random atlas*”, [MNRAS](#), **438:3409-3421** (2014)
- **M. Carrasco Kind**, R. J. Brunner, “*Implementing Probabilistic Photometric Redshifts*”, [ASPC](#), **475, 69C** (2013)
- **Matias Carrasco Kind**, R. J. Brunner, “*Precision Cosmology with a New Probabilistic Photometric Redshifts Approach*”, [American Astronomical Society Meeting Abstracts:None](#) (2013)
- **Matias Carrasco Kind**, RobertJ. Brunner, “*TPZ: photometric redshift PDFs and ancillary information by using prediction trees and random forests*”, [MNRAS](#), **432:1483-1501** (2013)
- **Matias Carrasco Kind**, Robert Brunner, “*TPZ: Trees for Photo-Z*”, [Astrophysics Source Code Library:1304.011](#) (2013)

Books and Thesis

- **Carrasco Kind, M.**, 2014, “*Probabilistic Photometric Redshifts in the era of petascale astronomy*”, Ph.D. Thesis, University of Illinois at Urbana Champaign
- **Carrasco Kind, M.**, White S. & Barrientos, F., 2006, “*Spatial distribution and formation times of dark matter halos from the Millenium simulation*”, B.S. Thesis, Pontificia Universidad Catolica de Chile
- “*Fisica 3*”, ed. Santillana, Chile, 2010 (Book Reviewer and Chapter Co-Author)
- “*Quimica 4*”, ed. Santillana, Chile, 2011 (Book Reviewer and Scientific Advisor)