Wladimir Lyra CURRICULUM VITAE

Contact Information

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	New Mexico State University
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Education

Uppsala University, Sweden	Astronomy	Ph.D. 2009
Uppsala University, Sweden	Astronomy	Ph.Lic. (M.Sc. equiv) 2007
Federal University of Rio de Janeiro, Brazil	Astronomy	B.Sc. 2003

Relevant Employment

May 2022	–		Associate Professor	New Mexico State University, Las Cruces, NM
Aug 2015	–	Oct 2023	Affiliate Scientist	NASA/JPL-Caltech, Pasadena CA
Aug 2019	–	Apr 2022	Assistant Professor	New Mexico State University, Las Cruces, NM
Aug 2015	–	Aug 2019	Assistant Professor	California State University, Northridge, CA
Dec 2011	–	Jan 2015	NASA Carl Sagan fellow	NASA/JPL-Caltech, Pasadena CA
Nov 2009	–	Dec 2011	Postdoctoral researcher	AMNH, New York NY
Apr 2009	–	Oct 2009	Research assistant	MPIA, Heidelberg, Germany
Jul 2003	–	Jul 2004	Research assistant	CTIO, La Serena, Chile
Jun 2002	–	Aug 2002	Summer research intern	STScI, Baltimore MD

Grants, Honors, and Awards

Grants - Total: **$ 5.3M**

NASA Emerging World	NASA-EW (Inst PI, $ 754k)	2023
NASA Exoplanet Research Program	NASA-XRP (Inst PI, $ 531k)	2023
NASA Emerging World	NASA-EW (Inst PI, $ 547k)	2023
National Science Foundation	NSF-AAG (co-I share, $ 174k)	2022
NASA Emerging World	NASA-EW (PI, $ 366k)	2021
NASA Theory and Computational Astroph. Networks	NASA-TCAN (PI, $ 1.3M)	2020
National Science Foundation	NSF-AAG (PI, $ 324k)	2020
NASA New Frontiers and Data Analysis Program	NASA-NFDAP (co-I $ 240k)	2019
NASA Exoplanet Research Program	NASA-XRP (co-I share $ 130k)	2018
National Radioastronomy Observatory (NRAO)	ngVLA (Inst PI, $ 81k)	2017
NASA Exoplanet Research Program	NASA-XRP (PI, $ 250k)	2016
Space Telescope Science Institute	Hubble Cycle 24 (PI, $ 134k)	2016
National Science Foundation	NSF-AAG (PI, $ 461k)	2010

Other grants

International Astronomical Union	Office of Astronomy for Development (20k ZAR)	2020
International Astronomical Union	Office of Astronomy for Development ($ 10k)	2019
American Physical Society	US-India Travel Grant Program ($ 4k)	2018
International Astronomical Union	Office of Astronomy for Development ($ 10k)	2017
California State University	Probationary Faculty Support Program ($ 5k)	2016
American Museum of Natural History	Kalbfleisch postdoctoral fellowship	2009-2010
European Science Foundation	Grant for Pencil Code meeting (€ 5k)	2009
German Science Foundation (DFG)	Grant for Pencil Code meeting (€ 5k)	2009
Uppsala University	Håkansson foundation (10k SEK)	2008
	Liljwalchs foundation (10k SEK)	2007
	Anna & Allan Löfbergs fellowship	2004-2006
Brazilian Research Council	Undergraduate research grant	2000-2003

Honors & awards

NMSU Teaching Academy	Truly Innovative Teaching Award	2023
NMSU College of Arts and Sciences	Outstanding Faculty Achievement in Teaching	2023
NMSU College of Arts and Sciences	Outstanding Faculty Achievement in Research	2022
NMSU College of Arts and Sciences	Outstanding Faculty Achievement in Outreach	2021
Max Planck Society	Visiting scholar	2018,2019
Japanese Society for the Progress of Science	Visiting fellow	2015-2016
NASA Exoplanet Science Institute	Sagan Fellowship ($ 309k)	2011-2014

Computer allocations

Access		2023
Access		2022
NASA	25M CPU hours	2021
XSEDE	7M CPU hours (equiv $25k)	2021
XSEDE	5M CPU hours (equiv $20k)	2020
XSEDE	3M CPU hours (equiv $17k)	2019
XSEDE	800k CPU hours (equiv $4k)	2018
XSEDE	1M CPU hours (equiv $40k)	2017
XSEDE	800k CPU hours (equiv $ 30k)	2016
Teragrid	600k CPU hours (equiv $ 22k)	2013

Professional Memberships

International Astronomical Society; 2021 - present
American Astronomical Society; 2019 - present
Canadian Astronomical Society; 2012 - 2016
Swedish Astronomical Society; 2005 - 2009; 2021 - present

Teaching Experience

- New Mexico State University

  - ASTR 506 Dynamics and Hydrodynamics, Spring 2021, Spring 2023, Spring 2025.
  - ASTR 305V Life in the Universe, Fall 2021, Fall 2022, Spring 2024, Fall 2024.
  - ASTR 621 Planet Formation Theory. Spring 2020, Spring 2022.
  - ASTR 500 Graduate Seminar: Principles of Public Speaking. Spring 2022.
  - ASTR 503 Fundamental Astronomy, Fall 2019, Fall 2020, Fall 2021, Fall 2023.
  - ASTR 598 Independent Study. Fall 2019, Fall 2020, Fall 2022, Fall 2023.

- California State University, Northridge
  - ASTR 301 Dynamical Astronomy. Fall 2018.
  - ASTR 401 Radiative Processes in Astrophysics. Spring 2016, Spring 2017, Spring 2018.
  - ASTR 601 Selected Topics in Astrophysics. Fall 2015, Fall 2017.
  - PHYS 389 Mathematical Methods in Physics I. Fall 2016.

- International Center for Theoretical Physics - South American Institute for Fundamental Research, Jul-Aug 2024, São Paulo, Brazil. Invited lecturer at the winter school "Cosmological History: from Gravitational Waves to Exoplanets"

- Center for Computational Astrophysics, Flatiron Institute, NYC, Jul-Aug 2023. Invited lecturer at the Fluid Dynamics Summer School.

- Moscow Institute of Theoretical Physics, Summer 2017, invited lecturer for 2-week course on protoplanetary disks for the 13th Summer School of Modern Astrophysics, Moscow, Russian Federation.

- American Museum of Natural History: Teacher on the Museum's After-School program, for courses *Stars - An introduction to Stellar Astrophysics* (2010) and *Secrets of the Solar System* (2011).

- Uppsala University: Teaching Assistantship for the following courses: Physics of the interstellar medium (2007), Stellar Physics (2007), Classical Mechanics (2008).

- Federal University of Rio de Janeiro: Tutoring for Astronomy Students in Statistics (2001), Electromagnetism (2002), Quantum Mechanics (2003).

- Guest lecturer in undergraduate courses: *Introduction to Modern Astronomy* at Federal University of Rio de Janeiro (Apr 2015), *Astrophysics* at University of Ottawa (Nov 2012), *Minor bodies of the solar system* and *Stellar Physics* at University of Uppsala (May 2006 and Sep 2008, respectively).

- High-School and Pre-University Course. Teaching and tutoring Mathematics and Physics in the preparatory course for admission to University (from February 1999 to September 2000)

Research Advisor Experience

- New Mexico State University
  - Postdoctoral Researchers
    * Dr Daniel Carrera; 09/2024 - present.
    * Dr Debanjan Sengupta; 01/2022 - present.
  - Ph.D. students - Direct supervision

    * Olivia Brouillette; 08/2024 - present.
    * Eleanor Serviss; 08/2024 - present.
    * Leopold Hutnik; 08/2024 - present.
    * Daniel Godines; 01/2022 - present. Qualifying, coursework, and oral exam completed.
    * Sarah Chinski; 08/2021 - 01/2025. Exit with Coursework Master's.
    * Manuel Cañas; 08/2019 - 02/2023; Exit with Master's. "A Solution for the Density Dichotomy Problem of Kuiper Belt Objects With Multi-Species Streaming Instability and Pebble Accretion"
    * Harrison Cook; 08/2019 - present. Thesis proposal completed 10/2022 - "Unveiling the Structure of Active Galactic Nuclei using Electromagnetic and Gravitational Wave-Emitting Events"
    * Ali Hyder; 08/2019 - 06/2024. PhD thesis defended 06/26/2024 - "The Interplay of Moist Convective and Diffusive Transport in the Jovian Atmosphere"
  - PhD students - Committee member
    * Anne Peck - Thesis proposal completed 11/2023 - "Spectral Follow-Up and Bayesian Ages of Accelerating Candidate Exoplanet Host Stars".
    * Audrey Dijeau - Thesis proposal completed 09/2023 - "The Green Chile Project: Investigating and Defining a Class of Extended Emission Line Nebulae".
    * Amanda Stricklan - Thesis proposal completed 01/2023 -"In-depth analysis of the origin and evolution of coronal hole jets"
    * Hannah Gallamore - Thesis proposal completed 03/2023 - "Jupiter as an Exoplanet Analog: Quantifying the Effect of Atmospheric Variability on Retrieved Exoplanet Parameters".
    * Adam Smith - Thesis proposal completed 12/2022 - "SASSY: The Snapshot A-Star SurveY Hunting for Brown Dwarf Companions to High Mass Stars".
    * Matthew Varakian - 09/2019 - 04/2024 - "Investigating the Evolution of the Inner Solar System via Asteroid Reflectivity in the $3\mu m$ Region".
    * Kristen Luchsinger - 09/2019 - 10/2022 - "Solar Wind Implantation of Protons: Exploring The Delivery of Water Ice to Seasonal Shadowed Regions at the Lunar Poles".
    * Riley DeColibus - 08/2019 - 10/2023 - "A new look at the surface composition of Miranda".

- California State University, Nothridge
  - Postdoctoral Researchers
    * Luca Ricci; 2017-2018.
    * Natalia Dzyurkevich; 2017-2018.
    * Ana Maria Piso; 2018.
  - B.Sc. and M.Sc. students - Direct supervision
    * Joshua Shevchuk; B.Sc. 10/2016 - 05/2018; M.Sc 08/2018 - 05/2020; "Orbital migration and circularization as a source of heating in active galactic nuclei accretion disks"
    * Areli Castrejon; B.Sc. 10/2016 - 05/2017; M.Sc 08/2017 - 05/2019; "Disentangling the Effect of Planets from Photoeletric Instability In Debris Disks".
    * Vincent Carpenter; M.Sc. 10/2016 - 05/2018; "Implementing an Efficient Polar Self-Gravity Solver in the Pencil Code".

    * Alexandra Yep; M.Sc. 09/2015 - 08/2016; "Surface Pressures and Virial Terms of Molecular Clouds"
    * Gerard Valdellon; B.Sc. 03/2018 - 05/2019.
    * Christopher Malek; B.Sc. 11/2016 - 05/2019.
    * Sean Snyder; B.Sc. 09/2015 - 05/2016.

- External students
  - Felipe Alarcón; Universidad de Chile, 2017-2019; M.Sc. completed: "Physical conditions and kinematics in protoplanetary disks through gas and dust emission".
  - Leonardo Sattler-Cassara; Fed. Univ. Rio de Janeiro. Summer intern, 2014; B. Sc. 2014-2015; M.Sc. 2015-2017. M.Sc. completed: "Numerical simulations of convection in Europa: Tidal heating and external topography in three-dimensional models".
  - Blake Hord; Dobbs Ferry High School. Summer intern, 2016-2017. Article published: "On shocks driven by high-mass planets in radiatively inefficient disks. III. Observational signatures in thermal emission and scattered light".
  - Alexander Richert; Pennsylvania State University. Ph.D student, 2013-2017. Ph.D. completed: "The Evolution of Circumstellar Disks".
  - Joseph Cullen; Lawrence University. Summer intern, 2013; B.Sc. 2013-2014. Senior experience completed: "Planetesimal-driven Versus Gas Driven Planetary Migration in Circumstellar Disks"
  - Brandon Horn; Columbia University. Ph.D. student, 2010-2011. Article published: "Orbital migration of interacting low-mass planets in evolutionary radiative turbulent models".
  - Natalie Raettig; Ph.D student, University of Heidelberg. 2009-2013. Ph.D. completed: "Global Baroclinic Instability and its Implications on Planet Formation".
  - Heidar Thrastarson; Uppsala University. M.Sc. 2006-2007. M.Sc. completed: "Radiation energy transport in hydrodynamical models of protoplanetary disks"

Observational Experience

- Cerro Tololo Interamerican Observatory. Seventeen engineering nights at the 4m telescope scattered from oct/03 to jun/04 doing photometric observations of standard stars on JHK wavebands, to test Tololo's new infrared camera, ISPI. Observations were performed under supervision of CTIO staff Dr. Nicole S. van der Bliek and Dr. Dara Norman.
- Observatório do Pico dos Dias, Laboratório Nacional de Astrofísica, Brazil. Extensive experience using the 1.60m telescope at OPD/LNA, performing spectroscopic observations in optical wavelengths with a coude spectrograph. The dates when the observations took place were may/00, oct/00, jun/01, sep/01, oct/01, may/02, oct/02, dec/02.

Professional Development Activities

- **NMSU Teaching Academy**:
  - Seminar/Workshops 08/2019 - present: Engage & Enjoy Online Teaching, Fostering an Inclusive Class Environment Where all Students can Thrive, Fostering an Inclusive Class Environment Where all Students can Thrive New Mexico State University, Fulbright Scholarship Panel Session for Faculty, Promotion & Tenure Portfolios, Small Teaching Online:

Strategies to Help Students Engage and Learn, Teaching Gen Z in a Pandemic: Data-Based Strategies, The Goldilocks Strategy: Getting Yourself to "Just Right", Who is at your service? Differential distribution of faculty service at NMSU, Exploring Funding Opportunities for Graduate Students and Postdoctoral Scholars, How flipped classes can transition seamlessly to remote instruction, Negotiating a Positive and Productive Advisor-Advisee Relationship, P&T Workshop: Promotion to Associate Professor, Teaching STEM in the Time of Covid-19, Active Learning: What is it, how do you implement it and why would you want to?, Orientation for Faculty New to NMSU, Team Mentoring, Ten Easy Ways to Engage Your Students, The Quiz Tool in Canvas.

Service

- **Institutional Service**:
  - New Mexico State University
    - Department service
      - Associate Department Head (2024 - present)
      - Graduate admission chair (2023 - present)
      - Graduate curriculum committee (2021-present)
      - Graduate awards committee (2021-present)
      - Tenure-track faculty search committee (2020, 3x)
      - Graduate admissions committee (2020 - present)
      - Astro-ph committee (2019-present)
    - University service
      - Faculty Senate (2022-2023)
  - California State University, Northridge
    - Department service
      - Astronomy curriculum committee (2017-2019).
      - Chair of Physics and Astronomy Colloquium Series (2016-2017).
      - Lead of astronomy journal club (2015-2019).
      - Department Liaison to the International Education Council (2015-2019).
    - University service
      - Interdisciplinary advisory board of the Queer Studies Program (2015-2019).
- **Professional Service**
  - Conference organization
    - Organizer of Planets in the Desert - A Streaming Instability Code Comparison Workshop, Las Cruces NM, 2022.
    - SOC of Numerical Simulations of Planet-Disk Interactions, Cuernavaca, Mexico, 2017.
    - SOC of Exoplanets in Southern California (ExSoCal) 2017.
    - Co-chair of Phase Transitions in Astrophysics, Nordita, Stockholm, Sweden, 2017.
    - SOC of Exoplanets in Southern California (ExSoCal) 2016.
    - Co-organizer of Pencil Code Meeting 2010, New York, NY, USA.
    - Organizer of Pencil Code Meeting 2009, Heidelberg, Germany.

    * Organizer of Workshop "Turbulence-Assisted Planetary Growth", 2009, Uppsala, Sweden.
    * Member of LOC of Nobel Symposium 135: Physics of Planetary Systems, 2007, Stockholm, Sweden.
  - Computation: Co-developer (since 2005) and co-owner (since 2009) of the Pencil Code, a high-order finite-difference parallel code for MHD turbulence.
  - Reviews
    * NASA
      · ROSES (Research Opportunities in Space and Earth Science)
        Panel chair (2021, 2023).
        Panel member (2012, 2015, 2022, 2024, 2025)
      · NHFP (Hubble/Sagan/Einstein Postdoctoral Fellowship Program)
        Panel member (2020, 2021, 2025)
      · FINESST (Future Investigators in NASA Earth and Space Science and Technology)
        Panel member (2019, 2023).
      · NPP (NASA Postdoctoral Program)
        Panel member (2023).
    * NSF
      · AAG (Astronomy and Astrophysics Grants)
        Panel member (2010, 2012, 2015).
        External Reviewer (2014, 2021).
      · CAREER Panel member (2011, 2023).
      · GRFP Panel member (2023).
    * Space Telescope Science Institute (2020, 2021)
    * International external reviewer
      · Swiss National Science Foundation (2024)
      · UKRI Funding Service (2023).
      · Dutch Research Council (2023).
      · Austrian Science Fund (2023).
      · Chilean National Fund for Scientific and Technological Development, FONDECYT (2021).
      · Hungarian Academy of Sciences (2016, 2021).
      · Swiss National Supercomputing Centre (2021).
      · Academia Sinica (2020).
    * Journal reviewer
      · Referee for: Science, Astronomy & Astrophysics, Monthly Notices of the Royal Astronomical Society, Astrophysical Journal, Planetary and Space Sciences, PLOS One, Astronomy Education Journal, AGU Advances.

- Committees
  - ACCESS Researcher Advisory Committee - Chair (2023 -)
  - American Astronomical Society
    * Warner/Pierce prize selection committee (2022 -).
    * Executive committe of the Working Group for LGBT Equality (WGLE), 2013-2016.

Other skills

Programming proficiency: Fortran 90, Python, IDL, HTML (fluent); C, C++, Awk, Linux/C-shell, IRAF (good). Operating systems: GNU/Linux, Mac OS X.

Language Proficiency: Portuguese (native speaker); English, Spanish (fluent); Swedish, French (conversational); German, Italian, Danish, Norwegian (reading).

Publication List

Summary:

- Total publication count: **81 publications**. The acronyms and impact factors of the journals are listed below

Journal	*Acronym*	*Impact factor*
Nature		64.8 (2023)
Science		63.832 (2021)
Nature Astronomy		15.647 (2021)
The Astrophysical Journal Letters	ApJL	7.9 (2023)
Astronomy & Astrophysics	A&A	6.5 (2023)
Publications of the Astronomical Society of the Pacific	PASP	5.842 (2021)
Publications of the Astronomical Society of Australia	PASA	5.067 (2023)
Astronomical Journal	AJ	5.3 (2023)
The Astrophysical Journal	ApJ	4.9 (2023)
Monthly Notices of the Royal Astronomical Society	MNRAS	4.8 (2023)
Journal of Fluid Mechanics	JFM	4.245 (2021)
PLOS One		3.7 (2023)
Icarus		3.508 (2020)
The Planetary Science Journal	PSJ	3.4 (2023)
Astronomische Nachrichten	AN	0.676 (2020)

- First or second author: 41 peer-reviewed articles. **27 as first author**, 14 as second (10 of which student-led, marked with a blue star *).
- **h-index: 44, cited over 6000 times**.
- Rate of publication: **4.1 yr^{-1}** total, **2.2 yr^{-1}** as first or second author, **1.4 yr^{-1}** as first author.

Articles currently in review

81. Positive Feedback: How a Synergy Between the Streaming Instability and Dust Coagulation Forms Planetesimals.
Carrera, D., Lim, J., Eriksson, L, **Lyra, W.**, Simon, J. 2025, A&A, submitted.

Articles in press

80. Probing Conditions for Strong Clumping by the Streaming Instability: Small Dust Grains and Low Dust-to-gas Density Ratio.
Lim, J., Simon, J.B., Li, R., Carrera, D., Baronett, S.A. ; Youdin, A.N. ; **Lyra, W.**, Yang, & C.-C. 2024, ApJ, accepted.

Published referred articles

79. Magnetically Driven Turbulence in the Inner Regions of Protoplanetary Disks
Rea, D., Simon, J.B., Carrera, D., Lesur, G., **Lyra, W.**, Sengupta, D., Yang, C.-C., & Youdin, A. 2024, ApJ, 972, 128.

78. Rapid protoplanet formation in vortices: three-dimensional local simulations with selfgravity
Lyra, W., Simon, J., Umurhan, O., Yang, C-C., & Youdin,A. 2024, ApJL, 970, L19.

77. Streaming Instability and Turbulence: Conditions for Planetesimal Formation
Lim, J., Simon, J., Li, R., Armitage, P., Carrera, D., **Lyra, W.**, Rea, D., Yang, C.-.C., & Youdin, A. 2024, ApJ, 969, 130.

76. Planetesimal and planet formation in transient dust traps
Sandor Zs., Guilera O. M., Regaly Zs., & **Lyra, W.** 2023, A&A, 686 A78.

75. Length and Velocity Scales in Protoplanetary Disk Turbulence
Sengupta, D., Cuzzi, J., Umurhan, O., & **Lyra, W.** 2024, ApJ, 966, 90.

74. *A solution for the density dichotomy problem of Kuiper Belt objects with multi-species streaming instability and pebble accretion
Cañas, M., **Lyra, W.**, Carrera, D., Krapp, L., Sengupta, D., Simon, J.B., Umurhan, O., Yang, C.-C., & Youdin, A. 2023, PSJ, accepted.

73. Viscous heating as the dominant heat source inside the water snowline of V883 Ori
Alarcon, F., Casassus, S., **Lyra, W.**, Perez, S., & Cieza, L. 2023 MNRAS, accepted.

72. On wave interference in planet migration: dead zone torques modified by active zone forcing
Chametla, R., Chrenko, O., **Lyra, W.** & Turner, N. 2023, ApJ, 951, 1.

71. Aligning Retrograde Nuclear Cluster Orbits with an Active Galactic Nucleus Accretion Disc.
Nasim, S., Fabj, G., Caban, F., Secunda, A., Ford, S., McKernan, B., Bellovary, J., Leigh, N. & **Lyra, W.**, 2023, MNRAS, 522, 5393.

70. Stability Analysis for General Order Central Finite-difference Hyperdiffusivity with Time Integrators of Arbitrary Accuracy
Lyra, W., RNAAS, 7, 69 (Research note; moderated, not refereed).

69. An Analytical Theory for the Growth from Planetesimals to Planets by Polydisperse Pebble Accretion
Lyra,W., Johansen,A., Canãs, M., & Yang,C.-C. 2023, ApJ, 946, 60.

68. Hydro-, Magnetohydro-, and Dust-Gas Dynamics of Protoplanetary Disks
Lesur, G., Ercolano, B., Flock, M., Lin, M.-K., Yang, C.-C., Barranco, J. A., Benitez-Llambay, P., Goodman, J., Johansen, A., Klahr, H., Laibe, G., **Lyra, W.**, Marcus, P., Nelson, R.P., Squire, J., Simon, J. B., Turner, N., Umurhan, O.M., & Youdin, A.N. 2023, review chapter for Protostars and Planets VII, submitted. Eds: Shu-ichiro Inutsuka, Yuri Aikawa, Takayuki Muto, Kengo Tomida, and Motohide Tamura.

67. On the angle of sunset
Lyra, W., Cuadra, J., Lachaume, R., & Meftah, J., 2022, RNAAS, 6, 257 (Research note; moderated, not refereed).

66. The thermodynamics of stellar multiplicity: An analytic model for the dynamical evolution of binary star populations in dense stellar environments due to single-binary interactions
Leigh N., Stone, N.C., Webb, J., **Lyra, W.**, 2022, MNRAS, 517, 3838.

65. *Exploring Jupiter's Polar Deformation Lengths with High Resolution Shallow Water Modeling

Hyder, A., **Lyra, W.**, Chanover, N., Jackiewski, J., & Morales Juberias, R.
Planetary Science Journal, 3, 166

64. Linking atmospheric chemistry of the hot Jupiter HD 209458b to its formation location through infrared transmission and emission spectra
Dash, S., Majumdar, L., Willacy, K., Tsai, S.-M., Turner, N., Rimmer, P. B., Gudipati, M. S., **Lyra, W.**, & Bhardwaj, A., 2022, ApJ, 932, 20.

63. A Predicted Dearth of Hypervolatile Ices in Oort Cloud Comets
Lisse, C.M., Gladstone, G.R., Young, L.A., Cruikshank, D.P., Sandford, S.A., Schmitt, B., Stern, S.A., Weaver, H.A., Umurhan, O., Pendleton, Y.J., Keane, J.T., Parker, J.M., Binzel, R.P., Earle, A.M., Horanyi, M., El-Maarry, M., Cheng, A.F., Moore, J.M., McKinnon, W.B., Grundy, W. M., Kavelaars, J.J., Linscott, I.R., **Lyra, W.**, Lewis, B.L., Britt, D.T., Spencer, J.R., Olkin, C.B., McNutt, R.L., Elliott, H.A., Dello-Russo, N., Steckloff, J.K., Neveu, M., & Mousis, O., 2022, Planetary Science Journal, 3, 112.

62. Images of Embedded Jovian Planet Formation At Wide Separations Around AB Aurigae
Currie, T., Lawson, K., Schneider, G., **Lyra, W.**, Wisniewski, J., Grady, C., Guyon, O., Tamura, M., Kotani, T., Kawahara, H., Brandt, T., Uyama, T., Muto, T., Dong, R., Kudo, T., Hashimoto, J., Fukagawa, M., Wagner, K., Lozi, J., Chilcote, J., Tobin, T., Groff, T., Ward-Duong, K., Januszewski, J., Norris, B., Tuthill, P., van der Marel, N., Sitko, M., Deo, V., Vievard, S., Jovanovic, N., Martinache, F. & Skaf, N.
Nature Astronomy, 2022

61. Vortex solution in elliptic coordinates.
Lyra, W., 2021, RNAAS, 5, 180 (Research note; moderated, not refereed).

60. *Pebble trapping in vortices: Three-dimensional simulations.
Raettig, N., **Lyra, W.**, & Klahr, H. 2021, ApJ, 913, 92.

59. On the Origin and Thermal Stability of Arrokoths and Plutos Ices.
Lisse, C.M., Young, L.A., Cruikshank, D.P., Sandford, S.A., Stern, S.A., Weaver, H.A., Umurhan, O., Pendleton, Y.J., Keane, J.T., Gladstone, G.R., Parker, J.M., Binzel, R.P., Earle, A.M., Horanyi, M., El-Maarry, M., Cheng, A.F., Moore, J.M., McKinnon, W.B., Grundy, W.M., Kavelaars, J.J., Schmitt, B., Linscott, I.R., **Lyra,W.**, Lewis, B.L., Britt, D.T., Spencer, J.R., Olkin, C.B., McNutt, R.L., Elliott, H.A., Dello-Russo, N., Steckloff, J.K., & Neveu, M. 2021, Icarus, 365, 114072.

58. The Sublimative Evolution of (486958) Arrokoth.
Steckloff, J., Lisse, C., Safrit, T., Bosh, A., & **Lyra, W.** 2021, Icarus, 365, 113998.

57. Evolution of MU69 from a binary planetesimal into contact by Kozai-Lidov oscillations and nebular drag.
Lyra, W., Youdin, A.N., & Johansen, A. 2021, Icarus, 365, 113831.

56. The Pencil Code, a modular MPI code for partial differential equations and particles: multipurpose and multiuser-maintained.
The Pencil Code Collaboration, Brandenburg, A., Johansen, A., Bourdin, P., Dobler, W., **Lyra, W.**, Rheinhardt, M., Bingert, S., Haugen, N., Mee, A., Gent, F., Babkovskaia, N., Yang, C.-C., Heinemann, T., Dintrans, B., Mitra, D., Candelaresi, S., Warnecke, J., Käpylä, P., Schreiber, A., Chatterjee, P., Käpylä, M., Li, X.-Y., Krüger, J., Aarnes, J., Sarson, G., Oishi, J., Schober, J., Plasson, R., Sandin, C., Karchniwy, E., Rodrigues, L., Hubbard, A., Guerrero, G., Snodin, A., Losada, I., Pekkilä, J., & Qian, C., 2021, Journal of Open Source Software, 6, 58, 2807.

55. Orbital Migration of Interacting Stellar Mass Black Holes in Disks around Supermassive Black Holes II. Spins and Incoming Objects.
Secunda, A., Bellovary, J., Mac Low, M.-M. Mac Low, Ford, S., McKernan, B., Leigh, N.W.C., **Lyra, W.**, Sandor, Zs., & Adorno, J. 2020, ApJ, 903, 133.

54. Gas and dust dynamics in starlight-heated protoplanetary disks.
Flock, M., Turner, N., Nelson, R., **Lyra, W.**—, Manger, M., & Klahr, H. 2020, ApJ, 897, 155.

53. *Disentangling planets from photoelectric instability in gas-rich optically thin dusty disks.
Castrejon, A., **Lyra, W.**, Richert, A., & Kuchner, M. 2019, ApJ, 887, 1.

52. Ram-pressure stripping of a kicked Hill sphere: Prompt electromagnetic emission from the merger of stellar mass black holes in an AGN accretion disk.
McKernan, B., Ford, K. E. S., Bartos, I., Graham, M. J., **Lyra, W.**, Marka, S., Marka, Z., Ross, N. P., Stern, D., Yang, Y. 2019, ApJL, 884, 2.

51. The initial conditions for planet formation: Turbulence driven by hydrodynamical instabilities in protoplanetary disk Ohmic zone.
Lyra, W. & Umurhan, O. 2019, PASP review, 131, 1001.

50. Dust traps in the protoplanetary disc MWC 758: two vortices produced by two giant planets?
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25. *A parameter study for baroclinic disk instability.
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24. Intermmediate mass black holes in AGN disks I. Prodution & growth.
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23. Rossby wave instability at dead zone boundaries in 3D resistive magnetohydrodynamical models of protoplanetary disks.
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22. *A well-posed Kelvin-Helmholtz instability test and comparison.
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18. Meridional circulation in turbulent protoplanetary disks.
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16. Formation of planetary cores at Type I migration traps.
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10. The Alpha-Centauri binary system: Atmospheric parameters and element abundances.
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8. A comparative study of disc-planet interaction.
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7. On the difference between nuclear and contraction ages.
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6. Spiral structure of the Third Galactic Quadrant and the solution to the Canis Majoris debate.
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5. A link between stellar metallicity and the semi-major axis of extrasolar planets.
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4. Fine structure of the chromospheric activity in Solar-type stars: The Hα line.
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Other refereed publications

3. A Historical Method Approach to Teaching Kepler's 2nd law.
Lyra, W. 2021, Astronomy Education Journal, 1, 1, 24-36. https://edarxiv.org/a5bqn/

2. COVID-19 pandemics modeling with modified determinist SEIR, social distancing, and age stratification. The effect of vertical confinement and release in Brazil.
Lyra, W., do Nascimento, J.-D., Belkhiria, J., de Almeida, L., Chrispim, P.-P. & de Andrade, I. 2020, PLOS One, 15, 1. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0237627

1. Ad Astra Academy: Using Space Exploration to Promote Student Learning and Motivation in the City of God, Rio de Janeiro, Brazil.
Lyra, W., Rice, Melissa, Adler-Belendez, D., Jacobson, N., Pantelic, A., Garcia, K., Cassara, L., Crow, C., Hayne, P., Marlow, J. 2020, CAP (Communicating Astronomy with the Public), 27, 5-13, SOCarxiv (social sciences arxiv) https://osf.io/preprints/socarxiv/7w4sp/

Oral Communications

Summary: 24 invited talks in international conferences, 73 seminars and invited colloquia, 33 contributed talks, totalling 130 oral communications.

Invited talks and reviews

24. "Arrokoth: Orbital evolution to contact binary." Invited talk at *Minor Bodies of the Solar System: Space Missions, Observations, and Theory.* Ringberg, Germany, Dec 2024.

23. "Consequences of multi-species streaming instability" Invited talk at *New Horizons Science Meeting #56*, Baltimore MD, May 2024.

22. "Evidence for streaming instability and pebble accretion in the densities of Kuiper belt objects" Invited talk at *Lubow 75: 50 years of binaries and disks*, Las Vegas NV, May 2024.

21. "3D simulations of planet formation by vortex trapping" Invited talk at *Vertical Shear Instability Meeting*, Virtually everywhere (organized by University of Copenhagen, Denmark), Nov 2022.

20. "3D models of planet formation in vortices" Invited talk at *Spinning Fluids - Laboratory Fluid Dynamics for Disks and Planets* Ringberg, Germany, Sep 5-10, 2021

19. "Evolution of MU69 from a binary planetesimal into contact via Kozai-Lidov oscillations and nebular drag." Invited talk at *Planet Formation Meeting 2020* Virtually everywhere (organized by Lund University, Sweden), Nov 17-20, 2020.

18. "Evolution of MU69 from a binary planetesimal into contact via Kozai-Lidov oscillations and nebular drag." Invited talk at *Building Blocks of Planets 2020* Ringberg castle (planned, turned remote due to the covid-19 pandemics, Germany, Apr 14-16, 2020.

17. "Hydrodynamical instabilities in protoplanetary disks: a synthesis." Invited talk at *Turbulence and Structure Formation in Protoplanetary Disks 2019: Observation, Theory, and Experiments* Ringberg castle, Germany, July 8-12, 2019.

16. "Primer on disk simulations: Circumstellar and AGN disks." Invited talk at *Black Holes in the Disks of Active Galactic Nuclei Workshop* Center for Computational Astrophysics, New York NY, Mar 11-13, 2019.

15. "Planet signatures in Transition Disks." Invited talk at *2018 Sagan-Michelson fellows symposyum*, Pasadena, CA, Nov 8-9, 2018.

14. "Planetary shocks and spirals in accretion disks." Invited talk at *Numerical Simulations of Planet Disk Interaction*, Cuernavaca, Mexico, Nov 23, 2017.

13. "The Europa Clipper mission." Invited talk at *AstroCon17* (amateur conference), Casper WY, Aug 18, 2017.

12. "Hydrodynamical instabilities in the Ohmic dead zone in circumstellar disks and dwarf novae." Invited talk at *Confronting MHD Theories of Accretion Disks with Observations*, Kavli Institute for Theoretical Physics, Santa Barbara CA, Feb 28, 2017.

11. "How shocks driven by high-mass planets can explain the spirals seen in transition disks." Invited talk at *Exoplanets and Disks: Their formation and diversity*, Ishigaki, Okinawa, Japan, Feb 21-24, 2016.

10. "How shocks driven by high-mass planets can explain the spirals seen in transition disks.", Invited talk at *Protoplanetary Disk Dynamics and Planet Formation*, JAMSTEC, Tokyo, Japan, Sep 29-Oct 2, 2015.

9. "Gas dynamics in circumstellar disks: planet signatures and dynamical instabilities.", Invited review at *3rd DTA Symposium - The origins of planetary systems: from the current view to new horizons*, NAOJ, Tokyo, Japan, Jun 1-4, 2015.

8. "Rossby wave instability in MHD: inner and outer MRI-active/dead zone boundaries." Invited talk at *The Magneto-Rotational Instability confronts the observations*, Ringberg Castle, Bavaria, Germany, Apr 13-17, 2015.

7. "Non-axisymmetric structures in transition disks: dynamical instabilities without planets?", Invited talk at *Transition Disks and Planet Formation*, Leiden, The Netherlands, Mar 2-6, 2015.

6. "Gas in debris disks: a new way to produce patterns?", invited talk at *Thirty years of beta Pic and debris disk studies*, Paris, France, Sep 8-12, 2014.

5. "Gas in debris disks: a new way to produce patterns?", invited talk at *2012 Sagan/Michelson Fellows Symposium*, Pasadena, Nov 8-9, 2012.

4. "Elliptic and magneto-elliptic instabilities", invited review at meeting *Instabilities and structures in protoplanetary disks*, Marseilles, France, 17-20 September, 2012.

3. "Dynamics of the turbulent solar nebula", invited review at workshop *Dynamics and formation of the Oort Cloud*, Lille Observatory, Lille, France, 27-30 September 2011.

2. "The baroclinic instability in protoplanetary disks", invited talk at *Ringberg workshop on Geophysical and Astrophysical fluid flow: Baroclinic instability and protoplanetary accretion disks*, Ringberg Castle, Bavaria, Germany, 14-18 June 2011.

1. "The dramatic role of magnetic fields in the Solar Nebula", invited review at workshop *Energy transfer and conversion inside magnetospheres*, Uppsala, Sweden, May 23 2008.

Invited seminars and colloquia

73. Universidad Nacional de San Martin, Buenos Aires, Argentina, Aug 2024.

72. National Radioastronomy Observatory, Apr 2024.

71. Australian National University, Canberra, Australia, Mar 2024.

70. Monash University, Melbourne, Australia, Mar 2024.

69. University of New Mexico, Feb 2024.

68. Center for Computational Astrophysics, Feb 2023.

67. University of Texas, El Paso, Nov 2022.

66. Harvard-Smithsonian CfA - Institute for Theory and Computation, Lunch talk, Oct 2022.

65. Harvard-Smithsonian CfA - Institute for Theory and Computation, Colloquium, Oct 2022.

64. Los Alamos National Laboratory, Oct 2021
63. Universidad de Concepcion, Chile, Apr 2021.
62. Iowa State University, Oct 2020.
61. New Horizons Team Meeting, Mar 2020.
60. Steward Observatory, Tucson, Mar 2020.
59. NMSU, physics department, Nov 2019.
58. MPIA, Heidelberg, Germany, Jul 2019.
57. Caltech, Nov 2018.
56. University of Nevada, Las Vegas, Nov 2018.
55. California State University, Long Beach, Oct 2018.
54. Interdisciplinary Reseach Institute for the Sciences, CSUN, Oct 2018.
53. Lund University, Seminar, Lund, Sweden, Aug 2018.
52. MPIA, PSF Coffee, Heidelberg, Germany, Aug 2018.
51. University of Heidelberg, Germany, Jul 2018.
50. Nicolaus Copernicus Center for Astronomy, Warsaw, Poland, Jul 2018.
49. California State University, Los Angeles, Jan 2018.
48. JPL journal club, Oct 2017.
47. Pennsylvania State University, Sep 2017.
46. Observatório Nacional, Rio de Janeiro, Brazil, Aug 2017.
45. ASIAA, TIARA seminar, Taipei, Taiwan, July 2017.
44. Academia Sinica Institute for Astronomy and Astrophysics (ASIAA); colloquium, Taipei, Taiwan, July 2017.
43. Eotvos Loránd University, Budapest, Hungary, Jun 2017.
42. Uppsala University, May 2017.
41. University of California at San Diego, Apr 2017.
40. University of Hawaii, Apr 2017.
39. University of Delaware, Apr 2017, seminar.
38. University of Delaware, Apr 2017, colloquium.
37. Observatório Calán, Santiago, Chile, Jan 2017.
36. Pontifícia Universidad Católica, Santiago, Chile, Jan 2017.

35. University of California at Santa Cruz, Nov 2016.
34. San Francisco State University, Oct 2016.
33. MPIA, PSF Coffee, Heidelberg, Germany, Jun 2016.
32. Planetary Sciences Colloquium, Caltech, Apr 2016.
31. Nagoya University, Seminar, Nagoya, Japan, Dec 2015.
30. Yuk Lunch, Caltech, Nov 2015.
29. California State University, Fullerton, Oct 2015.
28. NAOJ, Tokyo, Japan, seminar, Jun 2015.
27. UFRJ, Rio de Janeiro, Brazil, seminar, May 2015.
26. JPL Science Visitor and Colloquium Program, Pasadena CA, May 2015.
25. Princeton University, Princeton NJ, May 2015.
24. NASA Goddard Space Flight Center, Greenbelt MD, May 2015.
23. University of Amsterdam, Amsterdam, the Netherlands, Mar 2015.
22. Leiden Observatory, Leiden, the Netherlands, Mar 2015.
21. California State University, Northridge, Feb 2015.
20. Western Washington University, Bellingham WA, Geology Colloquium, Jan 2015.
19. Western Washington University, Bellingham WA, Physics Colloquium, Jan 2015.
18. Konkoly Observatory, Budapest, Hungary Nov 2014
17. UC Santa Barbara, AstroSeminar, Nov 2014
16. McGill University, Montreal, Special AstroSeminar, Sep 2014
15. UCLA, Institude for Planets and Exoplanets lunch seminar, May 2014
14. University of California at Berkeley, Seminar, Berkeley CA, Apr 2014
13. Nagoya University, Seminar, Nagoya, Japan, Mar 2014
12. Nordic Institute for Theoretical Physics, Seminar, Stockholm, Sweden, Nov 2013
11. JPL Exoplanet Science Seminar, Pasadena CA, Oct 2013
10. Lund University, Seminar, Lund, Sweden, Jun 2013
9. Carleton University, Physics colloquium series, Ottawa ON, Canada, Oct 2012
8. Université de Montréal, Seminar, Montréal QC, Canada, Sep 2012
7. Queen's University, Seminar, Kingston ON, Canada, Sep 2012
6. Caltech Infrared Processing and Analysis Center, Lunch seminar, Pasadena CA, Apr 2012

5. Cornell University, Seminar, Ithaca, NY, Feb 2011
4. NASA Goddard Space Flight Center, Seminar, Greenbelt MD, Dec 2010
3. Institute for Advanced Studies, Astro-coffee discussion, Princeton NJ, Dec 2010
2. American Museum of Natural History, Seminar day, New York NY, Nov 2009
1. Lund University, Seminar, Lund, Sweden, Mar 2009

Contributed talks

33. Pebbles in Planet Formation: Polydisperse Pebble Accretion: doing away with Planetesimal Accretion, NAOJ, Feb 2025.
32. Committee on Space Research (COSPAR), remote, Jan 2021.
31. Division of Planetary Sciences, remote, Oct 26-30, 2020.
30. New Horizons in planetary systems Victoria BC, Canada, May 13-17, 2019.
29. Nice-Scania meeting on planetesimal formation Frejus, France, Mar 17-20, 2019.
28. ExSoCal2018 - The 4th Annual Gathering of Southern California Exoplaneteers Caltech, Pasadena CA, Sept 17-18, 2018.
27. Numerical Simulations of Planet Disk Interaction, Cuernavaca, Mexico, Nov 23rd, 2017.
26. ExSoCal2017 - The 3rd Annual Gathering of Southern California Exoplaneteers Caltech, Pasadena CA, Sept 18-19, 2017.
25. Comet formation paradigm after Rosetta. Sofia, Bulgaria, Jun 19-23, 2017.
24. XV Latin American Regional IAU Meeting (LARIM), Cartagena de Indias, Colombia, Oct 3-7, 2016.
23. Pencil code user meeting 2016, Space Research Institute, Austrian Academy of Sciences, Graz, Austria, Aug 8-12, 2016.
22. Protoplanetary Discussions, Edinburgh, Scotland, UK, Mar 7-11, 2016 (cancelled participation).
21. ExSoCal2015 - An exoplanet orbital interaction, Caltech, Pasadena CA, Sept 24-25, 2015.
20. Disk dynamics and planet formation, Larnaka, Cyprus, Jun 29 - Jul 3, 2015 (cancelled participation).
19. Pencil code user meeting 2014, Max Planck Institute for Solar System Research, Göttingen, Germany, Jul 7-11, 2014.
18. Bay Area Exoplanet Meeting #9, SETI Institute, Mountain View, CA, Jun 6, 2014.
17. Exoplanets and disks: their formation and diversity II, Kona, Hawaii, Dec 8-12, 2013.
16. Pencil code user meeting 2013, Lund, Sweden, June 17-20, 2013.

15. Formation, detection, and characterization of extrasolar planets habitable planets, Beijing, China, Aug 27-31, 2012.
14. The origin of stars and their planetary systems, Hamilton, Canada, June 10-15, 2012, Annual meeting of the Canadian Astronomical Society, Calgary, Canada, June 05-07, 2012.
13. Pencil code user meeting 2011, Toulouse, France, Oct 24-28, 2011.
12. EPSC-DPS joint meeting 2011. Exoplanet and origins, Nantes, France, Oct 02-07, 2011.
11. Annual meeting of the Astronomical Society of New York, Rochester, NY, Apr 09, 2011.
10. Planet formation and evolution, Göttingen, Germany, Feb 14-16, 2011.
9. The Astrophysics of Planetary Systems: Formation, Structure, and Dynamical Evolution, Torino, Italy, Oct 11-15, 2010.
8. Pencil code user meeting 2010, New York, NY, Jul 26-30, 2010.
7. Pencil code user meeting 2009, Heidelberg, Germany, Aug 24-28, 2009.
6. Extrasolar planets in multibody systems, Toruń, Poland, Aug 25-29, 2008.
5. Turbulence and oscillations in accretion disks, Stockholm, Sweden, Oct 1-15, 2008.
4. Pencil code user meeting 2008, Leiden, The Netherlands, Aug 19-22, 2008.
3. Pencil code user meeting 2007, Stockholm, Sweden, Aug 14-17, 2007.
2. 9th MHD days, 2006, Heidelberg, Germany, Dec 4-5, 2006.
1. Pencil code user meeting 2006, Copenhagen, Denmark, July 13-15, 2006.

Outreach

Below I list the popular science articles and press releases that I wrote or were written about my work, plus interviews.

In particular, I am very interested in the power of education in promoting social change. Because of it, a cause I embrace is science outreach in low-income communities. I am a co-ordinator and Brazil site Director for *Ad Astra Academy*, a unique education, outreach, and development project that brings the excitement of exploration to students in some of the most underserved regions of the world. We did a pilot project in the infamous City of God favela in Rio de Janeiro, Brazil, in 2015 (with crowdfunding), an edition in Oakland in the summer of 2017, another in Bangladesh in December 2017 (with a grant from National Geographic), and we returned to Rio de Janeiro this summer (with a grant from the IAU - Office of Astronomy for Development). Link to the project: `http://www.adastra.world/`, and promotional video: `https://vimeo.com/165655662`.

Other active outreach activities are: 1) *Star News*, a monthly column at the Las Cruces Sun News, our local newspaper; 2) *Out in Space*, a podcast with interviews with LGBT astronomers, and 3) *Astronomy on Tap*, which I started a satellite location in Las Cruces.

- Ad Astra Academy
  - Approved as Broader Impacts component of NSF proposal for a Las Cruces-based program (Jun 2020).
  - Article in the Brazilian outreach journal *Planetaria* about Ad Astra (in Portuguese), Mar 2018.
  - Write-ups on *Mars Academy*, our outreach program in the favelas of Rio de Janeiro. Jornal do Brasil (in Portuguese), Nov 2015.
  - Write-up on the interview in the TV show *Science in Movement*, June 2015 (in Portuguese).
  - Live interview for *Science in Movement*, Brazil, June 2015 (in Portuguese).
  - Live interview for *Science and Astronomy*'s hangout podcast show, May 2015, (in Portuguese).
  - Write-up on the interview by *Science in Movement*, Mar 2015 (in Portuguese).
  - Live interview for *Science in Movement*, Brazil, Mar 2015 (in Portuguese).
  - News story in the *Wired*.
  - News story in *Veja*, a leading Brazilian weekly newsletter (in Portuguese).
  - News story in *Le Figaro*, leading French newspaper (in French).
  - News story in *O Globo*, a leading Rio newspaper (in Portuguese).
- Panels and Outreach Talks

13. Public talk at the Christchurch Public Library, New Zealand (Mar 2024).
12. Public talk at the Astronomical Society of Las Cruces (Jun 2023).
11. Moderated panel on the 90th anniversary of Pluto's discovery by Clyde Tombaugh (Feb 2020).
10. Open House at Tombaugh Observatory (Jan 2020).
9. Public talk at the Astronomical Society of Las Cruces (Jan 2020).
8. Talk at Las Cruces High School (Oct 2019).
7. Talk at the local CSUN Planetarium about the Europa Clipper Mission, Mar 2018.

6. Talk at the local CSUN Planetarium about Exoplanets and Planet Formation, Sep 2017.
5. "The Europa Clipper mission" Invited talk at the amateur astronomer conference *AstroCon 17*, Casper WY, Aug 2017.
4. Panel about life in the Universe at the West Valley Branch of the LA public library, Aug 2017.
3. Talk at de Toledo High School in Reseda, CA, May 2017.
2. Panel about time travel at the West Valley Branch of the LA public library in celebration of the 150th anniversary of H.G. Well's birth, Sep 2016.
1. Public talk, BIL conference, Long Beach CA, Apr 2013.

- Media Interviews

22. Interview with Regina Barber for National Public Ratio (NPR)'s science podcast "Short Wave".
21. Interview for Las Cruces Community Radio, Jun 2023.
20. Live chat for AAS journal author series playlist, May 2023.
19. Interview with KRQE - Albuquerque, Aug 2022.
18. Interview for KOAT - Albuquerque, May 2022.
17. Interview for Brazilian podcast *TôBlock* (in Portuguese), Apr 2022.
16. Interview for Santa Fe - New Mexican, Sep 2021.
15. Interview for Las Cruces Community Radio, Apr 2020.
14. Interview for Cosmic Perspective Radio at AstroCon17, Aug 2017.
13. Interview for *Globo*, a major Brazilian news channel, (in Portuguese), Jan 2016.
12. Interview and Q&A session for NICS XSEDE's podcast series. Write-up and formatting by Scott Gibson, Dec 2015.
11. Interview for National Geographic TV show *Strange Truths*, episode on asteroid and cometary impacts, Nov 2015.
10. Live hangout for *Science and Astronomy*'s podcast show, Oct 2015, about working at NASA (in Portuguese).
9. Interview for *Globo News*, a major Brazilian news channel, about the discovery of running liquid water on Mars (in Portuguese), Sept 2015.
8. Live hangout for *Science and Astronomy*'s podcast show, June 2015, (in Portuguese).
7. Q&A session for *Galileu*, a major monthly popular science publication in Brazil, Mar 2015 (in Portuguese).
6. Interview for the astronomy podcasting series at McGill university, Oct 2014.
5. Interview for podcasting show *Stuttering is Cool*, Aug 2013.
4. Live radio interview for the Southern California Science Radio, at invitation from the *Planetary Society*, in celebration of Carl Sagan's birthday (Nov 2012).
3. Interview for secularist blog *Bule Voador* (Flying Teapot, in Portuguese). Interview conducted by Eli Vieira, 2010.
2. Interview and report on *Fysikaktuellt* (in Swedish). Interview conducted by Ingela Roos, 2009.

1. *Uppsalaforskare löser rymdmysterium* (In English and Swedish). Interview on the Swedish radio Vetenskapsradion, 2009.

- Essays and Op-ed's

7. *Star News* at the Las Cruces Sun News
   - Jun 2024: Pluto: Planet or not
   - Mar 2024: What's a lunar calendar?
   - Nov 2023: The upcoming mission to Uranus
   - Oct 2023: The annular solar eclipse in New Mexico
   - Sep 2023: Blue Super Moon? Here's how to better understand the Moon's nicknames
   - Oct 2022: Jupiter, the King of the Night
   - Jun 2022: How did the Earth come to be?
   - Dec 2021: An astronomical Christmas gift: The James Webb Space Telescope.
   - Jun 2021: Why is NASA going back to Venus?
   - Apr 2021: Space Oddity – The first interstellar visitor is a nitrogen ice pancake.
   - Mar 2021: Here's why the mission to Mars matters.
   - Dec 2020: A death in the family: Astronomy mourns the loss of Arecibo.
   - Sep 2020: When black holes collide: Puzzling out the strange light of dead stars.
   - Aug 2020: Neowise, meteor showers and other comet tales.
   - Jul 2020: Tidally locked planets: Can life exist under a perpetual midnight sun?
   - Mar 2020: Living in a comet: how to build a Dyson treehouse.
   - Feb 2020: Blow up blow up, giant star...
   - Jan 2020: Starlink puts New Mexico front and center for the new space race.
   - Dec 2019: Zeroing in on an alien ocean.
6. Op-ed *Reach for the stars: Favela children to control NASA Mars mission*, for the Toronto-based independent news website "The Mark News", Apr 2015.
5. Op-ed *Ora, direis ouvir estrelas: Astronomia e a adesão do Brasil ao ESO* (Well, you say you listen to stars: Astronomy and Brazil joining ESO, in Portuguese), on the occasion of the Brazilian Lower House voting on the project, Mar 2015.
4. *Como é o banheiro dos astronautas?* (How does an astronaut's bathroom work, in Portuguese), in the Brazilian publication *Science for Children*.
3. *O céu como bandeira* (The sky for flag, in Portuguese), in the Brazilian publication *Teacher's Maganize*.
2. *Por que não nomear os exoplanetas?* Jornal do Brasil, Nov 2009 (Why not naming the exoplanets?, in Portuguese).
1. *Planeternas turbulenta födelse* (The turbulent birth of planets, in Swedish), popular write-up on Ph.D. thesis on forskning.se, 2009.

- Advocacy

5. Profile at 500 Queer Scientists (https://500queerscientists.com/wladimir-lyra)
4. Profile at the National Stuttering Association (https://westutter.org/team/wladimir-lyra/)
3. Out in Space Podcast with LGBT+ astronomers (2019-)
   - Kate Daniel - Assistant Professor at Bryn Mawr College.

  - Jen Connely - Senior Lecturer at the Rochester Institute of Technology.
  - Danielle Leonard - Lecturer at the University of Newcastle.
  - Carolyn Brinkworth - Chief Diversity, Equity, and Inclusion Officer at the University Corporation for Atmospheric Research.
  - Scott Gaudi - Professor at Ohio State University.
  - John Mulchaey - Director of the Carnegie Observatories.

2. Interviews with LGBT+ astronomers for the American Astronomical Society (AAS) working group on LGBT equality (WGLE, later committee on sexual and gender minorities in astronomy (SGMA); (2014-2015)
  - Jane Rigby - Civil servant astrophysicist at the NASA Goddard Space Flight Center.
  - Jessica Mink - Harvard Center for Astrophysics software developer, data archivist, and positional astronomer.
  - Omer Blaes - Professor at University of California, Santa Barbara.

1. 2013-2016. Member of the Working Group on LGBT+ equality (WGLE) of the American Astronomical Society, later renamed Committee for Sexual-Orientation and Gender Minorities in Astronomy (SGMA).

- Commentary and Consulting

7. Commentary on Scientific American about a recent paper on observations of planet-forming vortices, 2017.
6. Commentary on the anniversary of Relativity (in Portuguese), Jul 2015.
5. Post on LiHS, the Secular Humanist League of Brazil, on Brazil joining ESO, Feb 2015.
4. *Discover* magazine's story on the debate on exoplanet naming. Quotes from Alan Stern, Bill Borucki, Thierry Montmerle, Eva Plavalova, and myself. Jul 2014.
3. Commentary on HL Tauri. *Popular Astronomy*, Nov 2014 (in Swedish).
2. *Por que Marte não cresceu?* (Why didn't Mars grow bigger?, in Portuguese). Consulting in media science article, Igor Zolnerkevic. Jul 2014.
1. *Por que Urano gira de lado?* (Why does Uranus spin in its side?, in Portuguese), Igor Zolnerkevic. Consulting on media science article, 2011.

- Selected Press Coverage

30. NMSU News room: "NMSU astronomer awarded two NASA grants", 18 Dec, 2024.
29. NMSU News room: "NMSU alum's astronomy degree takes him beyond the stars", 24 Jul, 2024.
28. NMSU News room: "NMSU planet formation research group receives second NASA Emerging Worlds grant", Jan 18, 2024.
27. Las Cruces Sun News "NMSU professor awarded NASA grant for Pluto research", Aug 20, 2022.
26. Las Cruces Sun News "NMSU professor has alternate theory on planet formation", May 24, 2022.
25. Las Cruces Sun News "NSF, NASA awards fund NMSU professor's research on how planets form", May 8, 2021.

24. Las Cruces Sun News "NMSU professor researches effectiveness of lockdowns by age groups to stop COVID-19 spread", Apr 3, 2021.
23. Las Cruces Sun News "Astronomy on Tap launches in Las Cruces", Jan 19, 2020.
22. IFLS story on our simulation of Photoelectric Instability.
21. NASA press-release on our simulation of Photoelectric Instability in disks (2.2 million visualizations, 394 thousand likes and 2700 comments in their Instagram post)
20. CSUN professors chase the Great American Eclipse.
19. Story on LA Daily News
18. *CSUN Today* (Feb 2016 and Jul 2015), CSUN's local newsleter, stories on my group and our research.
17. Proposed exoplanets may be just gas and dust *Nature press release*, Sid Perkins, Jul 2013.
16. News story on *Folha de São Paulo* about the Nature paper, Salvador Nogueira, (in Portuguese), Jul 2013.
15. Ring around the dust disk *Sky & Telescope*, Shari Balouchi, Jul 2013
14. Exoplanets in doubt after gaps found in theory ABC Science, Australia, Stuart Gary, Jul 2013
13. Evidence of alien planets? No, It's just gas. Space.com, Nola Redd, Jul 2013
12. Gas, not planets, may be source of rings around stars Science News, Jessica Shugart, Jul 2013
11. Using 18 000 processors to stir the digital pot. Exoplanet Exploration Newsletter, Jan 2013.
10. Black holes might form like planets. *Sky & Telescope*, Stephen Craft, 2012.
9. Dust rings not smoking gun for planets after all. *New Scientist*, Maggie McKee, May 2012.
8. *Na rota segura* (In Portuguese), Revista Pesquisa FAPESP, Marcos Pivetta. English translation: On a safe course, 2010.
7. *Planètes: On sait porquoi elles survivent à leur étoiles* (In French). Science et Vie, Roman Ikonicoff, 2010.
6. Simulations justify Earth's existence. *Sky & Telescope*, Ivan Semeniuk, 2010.
5. Why the Sun Never Swallowed the Earth. *Time* magazine, Michael Lemonick, 2010.
4. How Earth survived a fiery premature death. Slashdot, 2010.
3. How Earth survived its birth. Science Daily, original press-release by Kristen Phillips, 2010.
2. Gas giants may be followed by Earth-like planets (In Danish, Swedish, and Norwegian). Illustreret Videnskab - Illustrerad Vetenskap - Illustrert Vitenskap (Science Illustrated), 2008.
1. Habitable worlds may hide in gas giants' wake. *New Scientist*, David Shiga, 2008.