

# Erik ROSOLOWSKY

## Professor | Astrophysicist

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 Edmonton, Alberta, Canada    Canadian and U.S. Citizen



My work consists of teaching (40%), research (40%), and service to the university, professional, and public communities (20%). I am an award-winning teacher of introductory physics and astronomy, including development of the laboratory curriculum. My research studies star formation and how the evolution of the gas in galaxies connects generations of stars. This research uses long-wavelength observations with telescopes like the Atacama Large Millimeter/submillimeter Array (ALMA), the Very Large Array, and the Green Bank Telescope. I specialize in creating new computational and image processing methods to quantify the physics of star formation.

## EDUCATION

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August 2005	Ph.D., UNIVERSITY OF CALIFORNIA, BERKELEY, Berkeley, CA, USA
September 2001	> Thesis: <i>Molecular Cloud Populations Across Galactic Environments</i> > Advisor: Leo Blitz
August 2001	M.A., UNIVERSITY OF CALIFORNIA, BERKELEY, Berkeley, CA, USA
September 1999	
June 1998	B.A. Highest Honors, SWARTHMORE COLLEGE, Swarthmore, PA, USA
September 1994	

## PROFESSIONAL EXPERIENCE

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Present	Professor of Astrophysics, UNIVERSITY OF ALBERTA, Edmonton, AB, Canada
July 2022	> Associate Chair, Undergraduate Studies (2021-present)
June 2022	Associate Professor of Astrophysics, UNIVERSITY OF ALBERTA, Edmonton, AB, Canada
July 2016	> Academic Director, Physics Undergraduate Laboratories (2018-2020)
June 2016	Assistant Professor of Astrophysics, UNIVERSITY OF ALBERTA, Edmonton, AB, Canada
July 2013	
June 2013	Assistant Professor of Physics, UNIVERSITY OF BRITISH COLUMBIA, Kelowna, BC, Canada
January 2008	
December 2007	Postdoctoral Researcher, HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS, Cambridge, MA, USA
July 2005	> National Science Foundation Astronomy and Astrophysics Postdoctoral Fellow
June 1999	Mathematics Teacher, VIRGINIA EPISCOPAL SCHOOL, Lynchburg, VA, USA
September 1998	> Taught Algebra, Pre-calculus • Residence supervisor • Track coach

## HONORS AND AWARDS

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2023	Martin Award for Mid-Career Achievement, Canadian Astronomical Society
2019	Faculty of Science Excellent Teaching Award, University of Alberta
2018-2021	Teaching Fellow, Faculty of Science, University of Alberta
2012	Teaching Excellence and Innovation Award – Junior Faculty, University of British Columbia, Okanagan
2012	Curricular Innovation Award, University of British Columbia, Okanagan

## REPRESENTATIVE PUBLICATIONS

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Author on 342 Refereed Publications. h-index of 67 via NASA/ADS. Below are papers representing novel work in the field.

 [Full Publication List](#)

- > Dey, B., Rosolowsky, E., Cao, Y., et al. *The EDGE-CALIFA survey: exploring the star formation law through variable selection* (2019) Monthly Notices of the Royal Astronomical Society, 488, 1926
- > Colombo, D., Rosolowsky, E., Duarte-Cabral, A., et al. *The integrated properties of the molecular clouds from the JCMT CO(3-2)*

- High-Resolution Survey* (2019) Monthly Notices of the Royal Astronomical Society, 483, 4291
- > Koch, E. W., **Rosolowsky, E.**, Lockman, F. J., et al. *Kinematics of the atomic ISM in M33 on 80 pc scales* (2018) Monthly Notices of the Royal Astronomical Society, 479, 2505
  - > Koch, E. W., Ward, C. G., Offner, S., Loeppky, J. L., **Rosolowsky, E. W.**, *Identifying tools for comparing simulations and observations of spectral-line data cubes* (2017) Monthly Notices of the Royal Astronomical Society, 471, 1506
  - > Koch, E. W., **Rosolowsky, E.**, *Filament identification through mathematical morphology* (2015) Monthly Notices of the Royal Astronomical Society, 452, 3435
  - > **Rosolowsky, E.**, Pineda, J. E., Kauffmann, J., Goodman, A. A., *Structural Analysis of Molecular Clouds: Dendrograms* (2008) The Astrophysical Journal, 679, 1338

## TEACHING SUMMARY

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- > Introductory Mechanics (1st Year; Calculus and Algebra Based; 8 courses)
- > Physics Laboratory Development (Created new curriculum for 1st year lab programs; 8 courses)
- > Introductory Astronomy (1st Year; 8 courses)
- > Introduction to Quantum Mechanics and Relativity (2nd Year; 4 courses)
- > Stellar Structure and Evolution (3rd Year; 5 courses)
- > Galactic Astrophysics (3rd year; 3 courses)
- > Interstellar Medium and Star Formation (Graduate level; 3 courses)

## SUPERVISION AND MENTORING

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- > Ph.D. Students (6) – Harrison Corbould; Brianna Ball, Joshua Peltonen; Hamid Hassani (in progress); Soumen Deb (2022); Eric Koch (2020)
- > M.Sc. Students (9) – Maria Pettyjohn (2021), Joseph Nofech (2019), Alice Koning (2015), Kaylie Green (2015), Miayan Yeremi (2013), Robert Stutz (2011)
- > B.Sc. Students (56) – 12 at UBC and 42 at U. Alberta
- > Postdoctoral Researchers (2) – Dario Colombo (2014-2016), Veselina Kalinova (2015-2016)

## PROJECTS

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### PHYSICS AT HIGH ANGULAR RESOLUTION IN NEARBY GALAXIES (PHANGS)

SINCE 2015

<http://phangs.org>

The PHANGS survey uses best-in-class observations of nearby galaxies ALMA, the MUSE instrument on the VLT, and the Hubble and James Webb Space Telescopes. With these high-resolution observations, we will discover the physics that drives galaxy evolution through star formation. I am the Team Manager where I coordinate PHANGS projects and curate team data.

### DENSE GAS MAPPING WITH THE GREEN BANK TELESCOPE

SINCE 2007

[GAS Survey](#) [KEYSTONE](#) [DEGAS](#)

I am the data reduction lead on three large surveys using the Green Bank Telescope: the GAS, KEYSTONE, and DEGAS surveys. I wrote most of the data reduction, calibration, and analysis software for these projects. These studies map the physical conditions in the dense gas that directly forms stars in our galaxy and beyond.

### ATOMIC GAS MAPPING IN THE LOCAL GROUP OF GALAXIES

SINCE 2014

[Recent Publications](#)

My group is using the Very Large Array in New Mexico to observe the 21-cm emission line from the nearest neighbouring galaxies. Our high-resolution imaging has revealed a tight connection between the atomic and molecular gas in a galaxy, a feature of a rapidly evolving galactic environment.

### STRUCTURE IDENTIFICATION ALGORITHMS FOR THE ISM

SINCE 2007

[Dendrograms](#) [TURBUSTAT](#) [PYCPROPS](#)

My group develops algorithms to characterize the complex structure in star forming gas, characterizing the physics that regulates this process. We establish the ground truth for these statistics using numerical simulations.

### SCIENTIFIC SOFTWARE AND RESEARCH PLATFORMS

SINCE 2010

[CIRADA](#) [CARTA](#)

I manage the development of scientific research software and platforms, with a focus on meeting the Big Data challenge in exascale astronomy. I initiated development for the Cube Analysis and Rendering Tool for Astronomy (CARTA) and I am the Deputy PI for the Canadian Initiative for Radio Astronomy Data Analysis (CIRADA).