WILLIAM CRAMER

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RESEARCH INTERESTS

My research interests are primarily focused on exploring the effects of environment on the evolution of galaxies, as it relates to their gas content, gas evolution, star formation rate, and quenching, across cosmic time. I utilize a variety of high resolution instrumentation, including HST and ALMA, that allow us to push the boundaries of our understanding of the mechanisms behind galaxy evolution.

POSTDOCTORAL WORK

Arizona State University *2020 - Present*
Postdoctoral Research: Utilize multi-wavelength observations, with a particular focus on ALMA, of high redshift clusters to study the effects of environment on the ISM and galaxy evolution
Advisor: Prof. Allison Noble

EDUCATION

Yale University *2014 - 2020*
PhD in Astronomy (PhD conferred: August 2020)
Advisor: Prof. Jeff Kenney
Thesis: "The Effects of Ram Pressure Stripping on Galaxy Evolution and Star Formation through the Study of Stellar Populations and the Multiphase ISM"

Yale University
Master of Science (2017)
Master of Philosophy (2017)

The University of Chicago *2010 - 2014*
B.A. in Physics with a concentration in Astrophysics (Honors)

PUBLICATIONS *AS FIRST AUTHOR*

- **ADS public library:** ui.adsabs.harvard.edu/public-libraries/SD15x0zhQbyx7GCJTiR2yA
- **Cramer W. J.,** Noble, A., Massingill, K., Cairns, J., Clements, D., Cooper, M., Demarco, R., Matharu, J., McDonald, M., Muzzin, A., Nantais, J., Rudnick, G., Uebler, H., van Kampen, E., Webb, T., Wilson, G., Yee, H., (2022), ***accepted to ApJ***, arxiv-eprints: 2209.06929, A large-scale kinematic study of molecular gas in high-z cluster galaxies: Evidence for high levels of kinematic asymmetry
- **Cramer W. J.,** Kenney, J. D. P., Tonnesen, S., Smith, R., Wong, T., Jachym, P., Cortes, J. R., Cortes, P. C., Wu, Y.-T., (2021), *ApJ*, 921, 1, Molecular gas filaments and fallback in the ram pressure stripped Coma spiral NGC 4921
- **Cramer W. J.,** Kenney J. D. P., Cortes, J. R., Cortes, P. C., Vlahakis, C., Jachym, P., Pompei, E., Rubio, M., (2020), *ApJ*, 901, 2, ALMA Evidence for Ram Pressure Compression and Stripping of Molecular Gas in the Virgo Cluster Galaxy NGC 4402
- **Cramer W. J.,** Kenney J. D. P., Sun M., Crowl H., Yagi M., Jchym P., Roediger E., Waldron W., (2019), *ApJ*, 870, 2, Spectacular HST observations of the Coma galaxy D100 and star formation in its ram pressure stripped tail

PUBLICATIONS *AS CO-AUTHOR*

- McIntosh, S. W., **Cramer, W. J.,** Pichardo Marcano, M., Leamon, R., 2017, Nature Astronomy, 1, 86, The detection of Rossby-like waves on the Sun

PRESS RELEASE AND PUBLICITY

- **Cramer** et al. (2021) had an accompanying NRAO press release, https://public.nrao.edu/news/gas-reaccretion-seen-in-dying-galaxies/.
- **Cramer** et al. (2019) had an accompanying STScI press release, https://science.nasa.gov/long-gas-tail-spiral-galaxy-d100. It is ranked on Altmetric, a tool for measuring the impact of research through popular press and social media, as being in the top 5% for all research scores that they calculate.
- McIntosh, **Cramer**, et al. (2017) had an accompanying press release https://phys.org/news/2017-03-planetary-earth-sun.html. It was also ranked on Altmetric as being in the top 5% for all research scores that they calculate.

ACCEPTED OBSERVING PROPOSALS

As PI

ALMA Cycle 9 (in queue), "Studying resolved GMC properties in the disk of the nearby ram pressure stripped Virgo galaxy NGC 4402" (2022.1.01189.S) (14 hours) *2022*

ALMA Cycle 7, "The unique ram pressure stripped tail of the Coma galaxy D100" (2019.1.00905.S) (30 hours) *2019*

Palomar, "Tracing the effects of Ram Pressure Stripping on the ISM and SFR in the Coma cluster" (2 nights) *2017*

As Co-I

I have been involved in an additional >10 accepted observing proposals as a co-I for: HST, ALMA, Palomar, and the VLT.

OBSERVING AND TECHNICAL EXPERIENCE

ALMA Extensive experience in reducing a variety of complex source ALMA data with the *casa* package. Includes serving as an ALMA Ambassador in 2021 to teach general principles of radio interferometry, as well as how to use *casa*, to the wider astronomical community.

HST: WFC3/UVIS Experience using the DrizzlePac package for HST data reduction and image combination. Also full proficiency with the Astromatic data combination and analysis packages (Source Extractor, SWarp, SCAMP, MissFITS).

VLT-KMOS Experience in preparing the Phase II observing plan for the multi-arm IFU using the KARMA software.

Palomar 200 inch Large Field Camera (LFC) 2 nights of observing in R-band and Hα, later reduction of the data with my own custom reduction scheme.

SCIENTIFIC AND TECHNICAL TALKS

Contributed Talk *July 2022*
National Astronomy Meeting (NAM 2022)

Contributed Talk *June 2021*
Galaxy Cluster Formation II (GCF 2021)

Contributed Talk *April 2021*
Extragalactic Spectroscopic Surveys (GALSPEC 2021)

Dissertation Presentation *January 2020*
235th American Astronomical Society Meeting, Honolulu, HI

Science Lunch talk *December 2019*
University of Wisconsin-Madison

Lunch Talk *November 2019*
National Radio Astronomy Observatory, Charlotesville

Lunch Talk *October 2019*
Columbia University, NY

Lunch Talk *August 2019*
Center for Computational Astrophysics Flatiron Institute

Lunch Talk *June 2019*
Space Telescope Science Institute

Lunch Talk *November 2018*
Joint ALMA Observatory, Santiago

Lunch Talk *October 2017*
National Radio Astronomy Observatory, Charlotesville

POSTER PRESENTATIONS

ALMA2019: Science Results and Cross-Facility Synergies Meeting, Sardinia, Italy *October 2019*

233rd American Astronomical Society Meeting, Seattle, WA *January 2019*

European Week of Astronomy and Space Science, Symposium on Ram pressure Stripping and Galaxy Evolution, Prague, Czech Republic *June 2017*

American Meteorological Society Spring Meeting, Atlanta, GA *March 2013*

FELLOWSHIP AND RESEARCH EXPERIENCE

ALMA Ambassador *2020 - 2021*
Promote the ALMA array and educate the scientific community on its capabilities and how to apply for time

NRAO Student Observing Support Award *2016 - 2017*
Grant supporting research with ALMA
PI: Kenney, J.

National Science Foundation Research Experience for Undergraduates *2013*
High Altitude Observatory, NCAR, Boulder, CO
Mentor: Scott McIntosh

AWARDS AND HONORS

Chambliss Astronomy Achievement Student Award, American Astronomical Society *2019*
For exemplary research by undergraduate and graduate students who present at one of the poster sessions at the meetings of the AAS

Stephen B. Butler Scholarship Fund *2016 - 2017*
Two year grant supporting my PhD at Yale

MENTORSHIP

Charlie Gardner (post-baccalaureate, Yale University) *June 2021-*

- Primary supervisor of summer research student, now current graduate student at Rice University
- co-supervisor: Allison Noble
- Weekly one-on-one meetings with me, and bi-weekly group meetings
- He produced kinematic models, and measured kinematic asymmetry of a sample of 15 galaxies observed with ALMA in the Fornax cluster

SERVICE

ASU journal club
Co-organize the weekly extragalactic journal club arxiv discussion *2020-present*

Gemini proposal review *2022*

ALMA proposal review
As part of my service as an ALMA ambassador, I reviewed 15 ALMA student observing support proposals for archival research *2021*

Referee service
I have served as a referee for papers submitted to *ApJ*, and *A&A* *2020-present*

TEACHING AND OUTREACH

Yale University: Teaching Fellow
Responsible for: preparing section discussion plans and leading discussion section, holding office hours, creating problem sets and grading, assisting with student observing labs at the Yale teaching observatory, leading exam review

- ASTR 130: Origins and Search for Life in the Universe *2014, 2015, 2020*
- ASTR 120: Galaxies and the Universe *2016*
- ASTR 210: Stars and their Evolution *2017*

Outreach talks

Astronomy on Tap *2019*
Public outreach talk series aimed at the general public, participated in organizing the event and presenting a talk titled "A dying galaxy takes a plunge: ram pressure and how it slowly strangles galaxies in clusters"

Astronomical Society of Greater Hartford *2019*
Outreach talk for the Astronomical Society of Greater Hartford, an all-ages amateur astronomy club which host a monthly talk series.

SKILLS

Primary programming languages: IDL, Python
Familiarity with: UNIX, GNU/Linux, casa, DrizzlePac, iraf/PyRaf, ds9, Astromatic suite
Some familiarity with programming languages: SQL, r

LANGUAGE SKILLS

English: native language
Spanish: full professional proficiency