

# ANDREW EMERICK

## CURRICULUM VITAE

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### RESEARCH INTERESTS

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I study the formation and evolution of **galaxies**, from the smallest dwarf galaxies to massive galaxy clusters, using **hydrodynamics simulations** run on high performance supercomputers. In particular I am interested in properly modelling the detailed physics of **star formation** and **stellar feedback** in galaxy-scale simulations using ENZO. I am interested in how these processes drive galactic **chemical evolution** and determine gas and **stellar abundances** in observations of nearby dwarf galaxies.

### EDUCATION

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<b>Columbia University</b>	2019 ( <i>expected</i> )
Ph.D. Candidate, Blue Waters Fellow, Astronomy	
Thesis Project: <i>Feedback and Chemical Evolution of Dwarf Galaxies</i>	
Thesis Advisors: Greg L. Bryan, Mordecai-Mark Mac Low	
M.A., M.Phil Astronomy	2015
<b>University of Minnesota</b>	
B.S., Astrophysics, <i>Summa Cum Laude, with Distinction</i>	2013
Thesis Topic: <i>Evolution of Weak Magnetic Fields in a Turbulent Plasma</i>	
Thesis Advisor: Thomas W. Jones	
B.S., Physics	2013

### SELECTED PUBLICATIONS

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*Click here for a complete, up-to-date list of all of my publications:* [SAO/NASA ADS](#)

#### First-author journal articles

8. **A. Emerick**, G. L. Bryan, M-M. Mac Low, B. Côté, K. V. Johnston, B. W. O'Shea, "[Metal Mixing and Ejection in Dwarf Galaxies is Dependent on Nucleosynthetic Source](#)", 2018, *submitted to ApJ*, arXiv:1809.01167  
*Contributions:* Developed and ran simulations, led analysis, wrote paper
7. **A. Emerick**, G. L. Bryan, M-M. Mac Low, "[Simulating an Isolated Dwarf Galaxy with Multi-Channel Feedback and Chemical Yields from Individual Stars](#)", 2018, MNRAS, *in press*  
*Contributions:* Developed and ran simulations, led analysis, wrote paper
6. **A. Emerick**, G. L. Bryan, M-M. Mac Low, "[Stellar Radiation is Critical for Regulating Star Formation and Driving Outflows in Low Mass Dwarf Galaxies](#)", 2018, ApJ, **865**, L22  
*Contributions:* Developed and ran simulations, led analysis, wrote paper
5. **A. Emerick**, M-M. Mac Low, J. Greевич, A. Gatto, "[Gas Loss by Ram Pressure Stripping and Internal Feedback From Low Mass Milky Way Satellites](#)", 2016, *ApJ* **826**, 148-61  
*Contributions:* Developed and ran simulations, led analysis, wrote paper
4. **A. Emerick**, G. L. Bryan, M. E. Putman, "[Warm Gas in and Around Simulated Galaxy Clusters as Probed by Absorption Lines](#)", 2015 MNRAS **453**, 4051-69  
*Contributions:* Ran simulations, developed and conducted analysis, wrote paper
3. **A. Emerick**, X. Zhao, R. Rapp, "[Bottomonia in the Quark-Gluon Plasma and their Production at RHIC and LHC](#)", *Eur. Phys. J. A* (2012) **47**:72  
*Contributions:* Updated and ran semi-analytic model, conducted analysis, wrote paper

## Other journal articles

2. Smith, B. D... **Emerick, A.** (10<sup>th</sup>), et. al., “ [GRACKLE: a chemistry and cooling library for astrophysics](#)”, 2017, *MNRAS*, **466**, 2217-34  
*Contributions:* New functionality; wrote description in paper; bugfixes to code.
1. S. Brown, **A. Emerick**, L. Rudnick, G. Brunetti, “[Probing the Off-State of Cluster Radio Halos](#)”, 2011 *ApJ* **740** L28  
*Contributions:* Performed image-stacking analysis and contributed to writing of methods

## Conference Proceedings

4. **A. Emerick**, G.L. Bryan, M-M. Mac Low, “Feedback Driven Chemical Evolution in Simulations of Low Mass Dwarf Galaxies”. In: *AAS Meeting # 232, # 305.03; Bulletin of the American Astronomical Society*. [Talk abstract](#).
3. X. Zhao, **A. Emerick**, R. Rapp, “In-Medium Quarkonia at SPS, RHIC, and LHC” *Nuclear Physics A, Vol. 904, p. 611-614c*. Quark Matter 2012 - Proceedings. [Abstract](#)
2. **A. Emerick**, X. Zhao, R. Rapp, “Bottomonium in the QGP: production at RHIC and LHC.” *Fall Meeting of the APS Division of Nuclear Physics: Bulletin of the American Physical Society, Volume 56, Number 12*. [Poster abstract](#)
1. **A. Emerick**, S. Brown, L. Rudnick, “Stacking Detection of Diffuse Radio Halo Emission in Galaxy Clusters”. In: *AAS Meeting # 218, # 408.26; Bulletin of the American Astronomical Society, Vol. 43, 201*. [Poster abstract](#).

## HONORS, AWARDS AND GRANTS

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### Graduate Awards

Blue Waters Graduate Fellowship	2018 - present
NSF Graduate Research Fellowship	2014 - present
Columbia Dean’s Fellowship	2013 - present

### Research Grants

Blue Waters Graduate Fellowship: 1.6m CPU hours on Blue Waters	2018 - present
XSEDE Computing Grant: 1.8m CPU hours on Stampede	2017 - 2018
XSEDE Computing Startup Grant: 50k CPU hours on Stampede	2015 - 2016
Undergraduate Research Opportunities Grant	2012
Undergraduate Research Opportunities Grant	2010

### Travel Awards

Conference Experience for Undergraduates: APS Div. of Nuclear Physics	2011
APS Minority Scholarship: AAS 218 <sup>th</sup> Meeting - Boston	2011

### Undergraduate Awards

J. Morris Blair Scholarship in Physics	2012 - 2013
Laverne and Ted Jones Foundation Scholarship	2012 - 2013
Astronaut Scholarship Foundation Scholarship	2012 - 2013
Minnesota Space Grant Consortium Scholarship	2011 - 2012
Franklin Scholarship	2011
American Physical Society Minority Scholarship	2010 - 2012
University of Minnesota Gold National Scholarship	2009 - 2013

## SELECTED CONFERENCES AND SCIENTIFIC TALKS

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39. <b>Invited Talk:</b> U. of Washington, Astronomy Seminar, Seattle, WA	Jan. 2019 (planned)
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38. <b>Talk:</b> AAS 233 <sup>rd</sup> meeting, Seattle, WA	Jan. 2019 (planned)
37. <b>Invited Talk:</b> UC Santa Barbara Seminar, Santa Barbara, CA	Nov. 2018 (planned)
36. <b>Invited Talk:</b> Harvard-Smithsonian CfA ITC Seminar, Cambridge, MA	Oct. 2018
35. <b>Talk:</b> Pizza Lunch, Columbia University, New York, NY	Sep. 2018
34. <b>Talk:</b> MPIA Galaxy Coffee, Heidelberg, Germany	Sep. 2018
33. <b>Invited Talk:</b> S. Glover and R. Klessen Group Meeting ITA, Heidelberg, Germany	Sep. 2018
32. <b>Talk:</b> 15 <sup>th</sup> Potsdam Thinkshop: The Role of Feedback in Galaxy Formation, Potsdam, Germany	Sep. 2018
31. <b>Invited Talk:</b> Blue Waters Fellowship NCSA Visit, Champaign-Urbana, Illinois	Aug. 2018
30. <b>Talk:</b> Santa Cruz Galaxy Workshop 2018, Santa Cruz, CA	Aug. 2018
29. <b>Discussion Lead:</b> Isolated Quenched Galaxies Workshop V: Gas in Quenched Galaxies, Flatiron Institute, New York, NY	Jul. 2018
28. <b>Talk:</b> UC San Diego, Lunch Seminar, San Diego, CA	Jun. 2018
27. <b>Talk:</b> Stellar Abundances in Dwarf Galaxies Meeting-in-a-Meeting, AAS 232, Denver, CO	Jun. 2018
26. <b>Attendee:</b> Blue Waters Symposium 2018, Sun River, OR	Jun. 2018
25. <b>Talk:</b> Olympian Symposium 2018, Katerini, Greece	Jun. 2018
24. <b>Talk:</b> Enzo Workshop 2018, Georgia Tech, Atlanta, GA	May 2018
23. <b>Talk:</b> Pizza Lunch, Columbia University, New York, NY	Mar. 2018
22. <b>Discussion Lead:</b> Isolated Quenched Galaxies Workshop IV: Gas in Quenched Galaxies, Flatiron Institute, New York, NY	Feb. 2018
21. <b>Talk:</b> Galaxies Lunch: Dwarf Galaxies, Columbia University, New York, NY	Feb. 2018
20. <b>Talk:</b> NYC Local Group Local Group Meeting, Columbia University, New York, NY	Nov. 2017
19. <b>Talk:</b> NY Area Computational Hydro Workshop Flatiron Institute, New York, NY	Sep. 2017
18. <b>Poster:</b> GMT Community Science Meeting Chemical Evolution of the Universe, Tarrytown, NY	Sep. 2017
17. <b>Talk:</b> Columbia Astrofest, New York, NY	Sep. 2017
16. <b>Poster:</b> The Galaxy Ecosystem Flow of Baryons Through Galaxies, Garching, Germany	Jul. 2017
15. <b>Talk:</b> MIAPP Workshop In & Out: What Rules the Galaxy Baryon Cycle, Garching, Germany	Jul. 2017
14. <b>Talk:</b> Enzo Workshop 2017, San Diego Supercomputing Center, San Diego, CA	Jun. 2017
13. <b>Talk:</b> Pizza Lunch, Columbia University, New York, NY	Sep. 2016
12. <b>Attendee and LOC:</b> MODEST-16 American Museum of Natural History, New York, NY	Sep. 2016
11. <b>Poster:</b> Mapping the Pathways of Galaxy Transformation Across Time and Space, Avalon, CA	Aug. 2016
10. <b>Talk:</b> ITA Chalk Talk, Heidelberg, Germany	Apr. 2016
9. <b>Talk:</b> Columbia Astrofest, New York, NY	Sep. 2015
8. <b>Poster:</b> Lorentz Center Workshop: The Life and Death of Satellite Galaxies, Leiden, Netherlands	Apr. 2015
7. <b>Talk:</b> The Role of HI in Galaxies, Kuching, Malaysia	Sep. 2014
6. <b>Talk:</b> Columbia Astrofest, New York, NY	Sep. 2014
5. <b>Talk:</b> Enzo Workshop 2014, Columbia University, New York, NY	May 2014
4. <b>Poster:</b> University of Minnesota Undergraduate Research Symposium, Minneapolis, MN	Spring 2013
3. <b>Poster:</b> Fall Meeting of the APS Div. of Nuclear Physics, East Lansing, MI	Fall 2011
2. <b>Poster:</b> AAS 218 <sup>th</sup> Meeting, Boston, MA	May. 2011

1. **Poster:** University of Minnesota Undergraduate Research Symposium, Minneapolis, MN

Spring 2011

## OPEN SOURCE CODE DEVELOPMENT

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In support of open science, **all** of my simulation and analysis code is publicly available in online repositories on [Bitbucket](#) and [GitHub](#). I am a member and active contributor to multiple open-source code projects, including [Enzo](#), [Grackle](#), and [Enzo-E/Cello](#).

## TEACHING EXPERIENCE

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Tutor, Bespoke Education	2015 - present
Lab. T.A. Astronomy W1904: Astronomy Lab II	Spring 2015
Lab. T.A. Astronomy C1904: Astronomy Lab I	Fall 2014
T.A. Astronomy C1403: Earth, Moon, and Planets	Spring 2014
T.A. Astronomy C1836: Stars and Atoms	Fall 2013
Undergraduate Peer Mentor: Tutor at University of Minnesota	2011 - 2013

## SELECTED OUTREACH AND SERVICE

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Referee, <i>Monthly Notices of the Royal Astronomical Society</i>	2016 - present
Referee, <i>The Astrophysical Journal</i>	2016 - present
Outreach Volunteer, bi-weekly community stargazing, Columbia University	2013 - present
Columbia Astrophysics Lab Computing Committee	2017 - present
Lady of Lourdes Middle School, Harlem, New York , NY	Guest Speaker / Scientist, Our
Astronomy Seminar Organizer, American Museum of Natural History	2016 - 2017
Astrobites Writer	2013 - 2015

## STUDENTS ADVISED

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Alexandra Mannings, American Museum of Natural History	2015
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