

# PROF. CARA BATTERSBY

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RESEARCH INTERESTS 1) Star formation in extreme environments, 2) the Central Molecular Zone of the Milky Way, 3) Galactic Structure, 4) the formation of massive stars and star clusters.

PROFESSIONAL PREPARATION **Assistant Professor** August 2016 - present  
University of Connecticut (on research leave AY16/17)

**Research Associate** September 2017 - present  
Smithsonian Astrophysical Observatory

**National Science Foundation (NSF) Postdoctoral Fellow** August 2016 - July 2017  
Harvard-Smithsonian Center for Astrophysics

**Submillimeter Array (SMA) Postdoctoral Fellow** Sept. 2013 - July 2016  
Harvard-Smithsonian Center for Astrophysics

**Ph.D. Astrophysics, University of Colorado, Boulder, CO, Adviser: John Bally** 2013  
*"The Structure, Kinematics, and Evolution of Massive Star and Cluster Forming Regions"*

**M.A. Astronomy, Boston University, Adviser: Jim Jackson** 2008

**B.S. Physics & Astronomy, University of Massachusetts Amherst** 2006  
*summa cum laude, Advisers: Min S. Yun & Grant Wilson*

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PUBLICATIONS Cara Battersby has an h-index of 31, is an author on 61 refereed publications with a total citation count of 3,404 (computed September 2020 from the NASA Astrophysics Data Service Page). Complete publication list is on the following pages.

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SELECTED HONORS, GRANTS, AND AWARDS

- **Robert H. Goddard Honor Award** (<https://science.gsfc.nasa.gov/sci/awardswon>) 2019  
*"For outstanding team performance resulting in the delivery of a scientifically compelling, executable, low-risk Origins Space Telescope mission concept."*
- **PI: National Radio Astronomy Observatory** 2019  
*Student Observing Support Grant (\$34k)*
- **Co-PI: National Science Foundation Campus Cyberinfrastructure Grant** 2019  
*CC\* Compute: Shared Computing Infrastructure for Large-scale Science Problems (\$400k)*
- **Co-I: NASA Balloon Mission:** 2019  
*ASTHROS: Astrophysics Stratospheric Telescope for High-spectral Resolution Observations at Submillimeter-wavelengths (\$18k to UConn)*
- **NASA Group Achievement Award** 2019  
*for the "substantial and effective scientific, technical, and management work in developing the Large Mission Concept Studies for the 2020 Astrophysics Decadal Survey."*
- **Provost's Letter of Recognition for Teaching Excellence** 2017, 2018, & 2019
- **Shortlisted (top 5 of candidates worldwide) for the** 2018  
*Nature Research Awards for Inspiring Science*

- **PI: National Science Foundation Astronomy and Astrophysics Grant,** **2018**  
"3-D CMZ: Unveiling the Structure of our Galaxy's Central Molecular Zone" (\$390k)
- **PI: Templeton Foundation Grant,** "BiteScis: K12 Research Brief Engagement Pilot" (\$215k) **2017**
- UConn Internal Grants (\$37k total): (*NFIP 2017-2019, \$3k total, Co-I: Provost's Open Educational Resources Award 2017 \$10k, Co-I: Provost's Large Course Redesign Award 2017 \$26k*).
- **Appointed by NASA: Science & Technology Definition Team,** Origins Space Telescope **2016**

SELECTED PRESS

**Research in the News:**

- 2020 NASA Goddard Feature [Piercing the Dark Birthplaces of Massive Stars with Webb](#)
- 2019 Sky & Telescope [Astronomers Dream Big, Consider Four Future Space Telescopes](#)
- 2018 UConn Today [Researcher Profile](#)
- 2018 Nature [Research Awards for Inspiring Science](#)
- 2018 Forbes [NASA's Next Flagship Mission May Be a Crushing Disappointment for Astrophysics](#)
- 2017 phys.org [The Lifetimes of Massive Star-Forming Regions](#)
- 2016 phys.org [The Milky Way's central molecular zone](#)
- 2016 SciTechDaily [Astronomers Take A Closer Look at the Milky Way's Central Molecular Zone](#)
- 2016 Astronomy Now [Unravelling the Milky Way's Central Molecular Zone](#)
- 2016 United Press International [New study details skeleton of the Milky Way galaxy](#)
- 2015 astrobit.es [The Skeleton of the Milky Way](#)
- 2015 AAS Nova [Companions for "Nessie" in the Milky Way's Skeleton](#)
- 2015 Sky & Telescope [Making Massive Stars](#)
- 2015 space.com [Milky Way 'Bones' Could Reveal Secrets About Our Galaxy](#)
- 2014 Sky & Telescope [Cooking up High-Mass Stars](#)

**Outreach in the News:**

- 2017 Hartford Courant [UConn Eclipse Viewing; Partial Eclipse, Complete Awe for CT](#)
- 2017 Patch.com [Eclipse Viewing Tips; Eclipse Event; It was Eclipse and Ice Cream](#)
- 2017 Stamford Advocate [Sky Gazers Ready for Solar Eclipse](#)

SELECTED  
SUCCESSFUL  
OBSERVING  
PROPOSALS

<b>PI, 207 hours,</b> Atacama Large Millimeter Array (ALMA) Large Program	<b>2019</b>
<i>"ALMAGAL: ALMA Evolutionary study of High Mass Protocluster Formation in the Galaxy"</i>	
<b>Over 100 hours as Co-I</b> on the Atacama Large Millimeter Array (ALMA)	<b>2013-2019</b>
<b>Over 30 hours as Co-I</b> on the Very Large Array (VLA)	<b>2013-2019</b>
<b>PI, 550 hours,</b> Submillimeter Array (SMA)	<b>2014-2017</b>
<i>"CMZoom: The SMA Legacy Survey of the Central Molecular Zone"</i>	
<b>PI, 3 hours,</b> Atacama Large Millimeter Array (ALMA)	<b>2016</b>
<i>"Testing a New Mode for Cloud Collapse in Galaxy Centers"</i>	
<b>PI, 60 hours,</b> IRAM 30-m	<b>2015</b>
<i>"Mapping the Bones of the Milky Way"</i>	
<b>PI, 13 hours,</b> Very Large Array (VLA)	<b>2015</b>
<i>"The Importance of Filamentary Accretion Flows in Forming Massive Star Clusters"</i>	
<b>PI, 45 hours,</b> Submillimeter Array (SMA)	<b>2014</b>
<i>"Hidden Gems: Uncovering the Nature of Massive Starless Clumps"</i>	
<b>Co-I, 200 hours,</b> Atacama Pathfinder Experiment (APEX)	<b>2014</b>
<i>"H<sub>2</sub>CO Thermometry of the CMZ to understand its low star formation rate"</i>	
<b>PI, 3 hours,</b> Green Bank Telescope (GBT)	<b>2014</b>
<i>"The Structure and Kinematics of our Nearest Massive Proto-Cluster"</i>	

INVITED  
SCIENTIFIC  
PRESENTATIONS

**Summary:** Cara Battersby has given 7 invited review/keynote talks, 46 invited conference presentations and colloquia, and 13 invited public talks since 2013.

**Invited Review Talks** (7 since 2013):

- Harvard-Heidelberg Star Formation Workshop Review Talk, Cambridge, MA (11/13/19), Kavli Institute of Astronomy and Astrophysics *Forum on Gas in Galaxies*, Peking, China (09/10/19), Oxford *Origins Space Telescope Meeting*, Oxford, UK (09/05/2018), EWASS *Star formation at the centre of the Galaxy* Prague (06/26/2017), CIERA Fellows at the Frontiers at Northwestern (09/01/2016), Keynote speaker for *Mass Assembly from Clouds to Clusters* at the Sexten Center for Astrophysics, Italy (07/07/2014), BASH Symposium at the University of Texas Austin (10/07/2013).

**Invited Conference Presentations and Colloquia** (46 since 2013):

- **2020:** 11th CMB-S4 Workshop: Cosmology and Astrophysics in the Next Decade Virtual Talk in the *Our Galaxy* Session (08/11/2020), NASA Decadal Studies Session at the American Astronomical Society (01/08/2020)
- **2019:** NASA SOFIA Science Center Colloquium (12/18/19), University of Toronto Astrophysics Colloquium (12/11/19), Purdue University Astrophysics Seminar (10/28/19), NASA Goddard Space Flight Center Colloquium (10/01/19), Max Planck Institute for Astronomy Koenigstuhl Colloquium (07/05/2019), University of Toledo Astrophysics Colloquium (04/18/2019), Origins Space Telescope Overview at the Center for Computational Astrophysics (06/21/19), University of Massachusetts Astrophysics Colloquium (04/11/2019), The Space Astrophysics Landscape for the 2020s and Beyond, Invited Overview and Panel Chair of *Extreme Star Formation and Time Domain in Astrophysics* (04/03/2019), Yale Astrophysics Colloquium (01/24/2019)
- **2018:** Brown University Astronomy Seminar (11/29/2018), MIT Astrophysics Colloquium (11/06/2018), University of Arizona Astrophysics Colloquium (10/4/2018), Harvard-Smithsonian Center for Astrophysics Galaxies & Cosmology Seminar (03/27/2018), Oxford Workshop on Giant Molecular Clouds Oxford, UK (03/12/2018), Caltech Astrophysics Colloquium (03/07/2018), Wesleyan Astrophysics Colloquium (02/28/2018), SMA Special Session at the American Astronomical Society meeting (01/08/2018).
- **2017:** Union of Radio Science General Assembly and Scientific Symposium (08/22/2017), Trinity College Physics Seminar (03/31/2017), National Radio Astronomy Observatory Charlottesville Astronomy Colloquium (02/09/2017), Far-IR Science Interest Group Webinar (02/02/2017),
- **2016:** National Radio Astronomy Observatory Socorro Astronomy Colloquium (12/02/2016), Harvard-Heidelberg Workshop on Star Formation Heidelberg, Germany (11/08/2016), SMA Science in the Next Decade Taipei, Taiwan (10/27/2016), University of Texas Austin Astronomy Colloquium (09/14/2016), Kavli Institute for Theoretical Physics Santa Barbara *The Cold Universe* (04/25/2016), DRAO Astronomy Colloquium Penticton, BC (03/01/2016), NRC Herzberg Institute for Astronomy Colloquium Victoria, BC (02/29/2016), University of Connecticut Physics Seminar (02/11/2016), University of California, Berkeley Astronomy Colloquium (02/04/2016), Amherst College Physics and Astronomy Colloquium (01/26/2016),
- **2015:** Bates College Physics and Astronomy Colloquium (12/4/2015), University of Arizona Tucson FLASH and Origins Talks (11/13/2015), UMass Amherst Astronomy Colloquium (11/5/2015), IAU 'Scale-Free Processes' Focus Meeting Honolulu (08/13/2015), University of Florida, *Star & Planet Formation Workshop* (03/12/2015), American Museum of Natural History Colloquium, (02/05/2015).
- **2014:** National Radio Astronomy Observatory Filaments Workshop Charlottesville (10/10/2014),

Boston University Astrophysics Seminar (10/14/2014), MIT Haystack Observatory Colloquium (07/24/2014), Yale University Seminar (04/07/2014).

- **2013:** University of Florida *ASTROWIN* (02/15/2013), University of Florida Seminar, (02/12/2013).

**Invited Public Talks** (13 since 2016):

- Avon High School Classroom Presentation (12/09/19), Early College Experience Presentation to Visiting High School Teachers (09/30/19), Manchester Public Library (08/21/19), UConn Astronomy Association (04/24/2019), Wachusett Science Seminar at Holden public High School, MA (11/13/2018), Science Seminar at Avery Heights Assisted Living, Hartford, CT (10/31/2018), Sky Scrapers Amateur Astronomy Club, RI (05/11/2018), Keene Public Library in New Hampshire (03/09/2017), Sturbridge Rotary Club Massachusetts (01/30/2017), Arlington Retired Men's Club Massachusetts (10/12/2016), Aldrich Astronomical Society Massachusetts (10/08/2016), Astronomy on Tap in Cairns, Australia, (07/20/2016), Center for Astrophysics Observatory Nights, Posted online: [The Wild West of Star Formation](#) (04/21/2016).

RESEARCH  
MENTORSHIP

**Students Advised and Co-Advised:**

**Summary:** Cara Battersby has advised or co-advised 32 research students since 2013.

● **Nine Graduate Students:**

- Dani Lipman - UConn Graduate Student - "*3-D CMZ: Uncovering the Structure of our Galaxy's Central Molecular Zone*" (Fall 2020 - present)
- Yiyang Kuang - UConn Graduate Student - "*Simulated Observations of the Core Mass Function*" (Fall 2020 - present)
- Jennifer Wallace - UConn Graduate Student - "*3-D CMZ: Uncovering the Structure of our Galaxy's Central Molecular Zone*" (Spring 2020 - present)
- Steven Walczyk - UConn Graduate Student - "*Tidal Compression of Clouds in the Central Molecular Zone*" (Spring 2019 - Fall 2019)
- H Perry Hatchfield - UConn Graduate Student - "*Star Formation in the Central Molecular Zone*" (Summer 2017 - present)
- Mark Graham - Southampton Master's Student at Harvard - "*Extreme Star Formation in the Center of Our Galaxy*" (2014 - 2015)
- Catherine Zucker - Harvard Graduate Student (primary adviser Alyssa Goodman) - "*Milky Way Bones*" (2014 - 2018)
- Brian Svoboda - Graduate Student at University of Arizona (primary adviser Yancy L. Shirley) - "*The Nature of Starless Clumps*" (2013 - 2018)
- Nalin Vutisalchavakul - University of Texas, Austin (primary adviser: Neal J. Evans II) - "*The Star Formation Relation for Regions in the Galactic Plane: The Effect of Spatial Resolution*" (2013)

- **Sixteen UConn Undergraduate Students:** Eric Hilhorst (Spring 2020 - present), Hannah Koziol (Spring 2020 - present), Payal Shah (Spring 2020 - present), Eddie Herndon (Fall 2019 - present), Sean Oh (Fall 2019 - Spring 2020), Bryan Garcia-Medina (Fall 2019 - Spring 2020), Jonah Cerbin (Spring 2019), Joseph Giangregorio (Fall 2017 - Spring 2019), Harrison Hall (Spring 2018 - Summer 2019), Aisha Massiah (2018), Brian Zelickovics (Spring 2018), Anthony (Josh) Machado (Spring 2018 - Summer 2020), Alexa Abul (Fall 2017 - Spring 2018), Christopher Annuzzi (Fall 2017 - Fall 2018), Cooper Biancur (Fall 2017 - Spring 2018), Stephanie Santillo (Fall 2017).

- **Seven other Undergraduate and High School Students:** Elizabeth Gutierrez - Harvard Banneker Summer Student (co-adviser: Meredith MacGregor) (2017), Emma Kleiner - Nyack High School Student (2016-2018), Irene Vargas-Salzar - Harvard Summer REU student (2016), Den-

nis Lee - Harvard undergraduate student (2015 - 2016), Jimmy Castaño - Harvard undergraduate student (2015 - 2016), Liz Gehret - Harvard Summer REU student (2015 - 2016), AJ Cohn - Harvard undergraduate student (2015 - 2017).

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## TEACHING

### UConn:

**Prepped and Instructed a Large, Interactive Physics Course for Non-Majors:** PHYS 1025Q: Introductory Astronomy, University of Connecticut, Storrs, CT.

- Taught Spring 2020.
- Taught Spring 2019. *Received the Provost's Letter of Recognition for Teaching Excellence, SET scores of 5.0 for instructor and 5.0 for course Spring 2019*

**Developed and Instructed a New Interactive Physics Course for Majors:** PHYS 2701: The Foundations of Modern Astrophysics, University of Connecticut, Storrs, CT.

- Taught Fall 2017, Fall 2018, Fall 2019. *Received the Provost's Letter of Recognition for Teaching Excellence, SET scores of 5.0 for instructor and 5.0 for course each time taught.*
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## SELECTED SERVICE

### UConn Service:

- **Advising:**
  - UConn Physics Club Faculty Advisor (Fall 2018 - present)
  - Undergrad Faculty Mentor for SPS Chapter (Spring 2019, Spring 2020)
  - UConn Astronomy Association Faculty Advisor (2018 - present)
  - Research Mentor to 16 UConn undergraduate students and 3 graduate students. Wrote over 100 reference letters for over 30 students and postdocs, including 19 UConn undergraduate and 1 UConn graduate students (2017-present)
  - Organizer for Graduate Student Fellowship Information Presentation (Fall 2017 & 2018)
- **Committees:**
  - National Fellowships Incentive Program (NFIP) Committee (Fall 2020 - present)
  - University Scholar Program Committee Member for Nathan Wetherell (Fall 2020 - present)
  - Department of Physics Advisory Committee (Fall 2019 - present)
  - CLAS Big Data Task Force (Spring 2019)
  - Faculty Search Committee Member (Fall 2018 - Spring 2019)
  - Furniture Committee Member (Fall 2018 - Spring 2019)
  - Oral Preliminary Exam Committee Member for H Perry Hatchfield (04/25/2019)
  - Oral Preliminary Exam Committee Member for Mohammed Akhshik (11/02/2018)
  - University Scholar Program Committee Member for Emmerson Dang (2017-2018)
  - Oral Preliminary Exam Committee Member for Yasaman Homayouni (05/19/2017)
- **Development of UConn Astrophysics Program:**
  - Lead Development of Interactive New Astrophysics Course PHYS 2701 (2017)
  - Co-Creation of 6 new Astrophysics Courses, PHYS 2701, 2702, 4710, 4720, 4740, and 1040QE along with Profs. Whitaker and Trump (2016-2019)
  - Co-Development of Astrophysics Minor, along with Profs. Whitaker and Trump (2017)

### Service to Scientific Community:

- **Program Reviews**
  - National Radio Astronomy Observatory (NRAO) Program Review (2018)
- **Proposal Review Panels:**
  - NASA Astrophysics Data Analysis Program (2020)
  - Atacama Large Millimeter Array Time Allocation Committee (2019)
  - NASA Hubble Postdoctoral Fellowship Program (2018)

- Smithsonian Astrophysics Observatory Submillimeter Array (2015-2017)
- NASA Astrophysics Data Analysis Program (2015)
- **External PhD Thesis Defense Committee Member:**
  - Boston University, Taylor Hogge, (Dec. 2018 - present)
  - University of Victoria, Jared Keown (Sept. 2019)
- **Referee:** *Astrophysical Journal (ApJ)*, *Astronomy & Astrophysics (A&A)*
- **NASA-appointed member of the *Science & Technology Definition Team (STDT): Origins Space Telescope (OST)*** (03/11/2016 - January 2020)
- **NASA OST Group Leader** for:
  - The Milky Way, ISM, and Local Galaxy Science Group (2016 - 2020)
  - The OST Advocacy Group (2017 - 2020)
- **Science Organizing Committees:**
  - New England Star Formation Workshop, UConn (01/17/20)
  - Galactic Center Workshop, *New Horizons in the Galactic Center Astronomy and Beyond*, Keio University, Japan 2019
  - Olympian Symposium *Gas and Stars from milli- to mega-parsecs*, Greece in 2018
  - Chair of the Science and Local Organizing Committees for the [Harvard-Heidelberg Workshop on Star Formation](#) in 2015

SELECTED  
OUTREACH  
ACTIVITIES

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**Co-Founder and Leader of [BiteScis](#):** A program that brings together science graduate students with K-12 teachers to develop lesson plans to bring modern science research into the K-12 classroom. Lesson plans are freely available online at [bitescis.org](#). (2014-2020)

**Co-Founder and Leader of [CU-STARS](#):** Founded a new program at CU-Boulder to retain undergraduate students from traditionally underrepresented backgrounds in STEM during their first year. Organized public talk series, outreach events in underserved communities, and more. Estimated to have impacted 50 undergraduate and hundreds of high school students. The program is in its 9th year and is estimated to have impacted about 45 undergraduate and 100s of high school students (Leader: 2010-2013)

**Additional Highlighted Outreach Activities:**

- Led Astronomy Activity at Hartford Schools Physics Open House. (April 2018)
  - Co-organized solar eclipse viewing party. (August 2017)
  - Science Advisor for the Play "The Women who Mapped the Stars" by Joyce Van Dyke, premiering at the Central Square Theater. (07/01/2016 - 09/01/2017)
  - [ComSciCon](#) workshop organizer (2015-2017)
  - [WorldWide Telescope Ambassador](#) (2014-2016)
  - Leader of the Colorado Women in Astronomy Group: Organized the first-ever women in astronomy retreat and department public forum, in addition to leading monthly meetings and hosting guest speakers. (2010-2012)
-