All scientific sessions will be held at the:

**Indiana Convention Center**
100 S. Capitol Avenue
Indianapolis, IN 46225

**AAS Paper Sorters**
Karna Desai
Shantanu Desai
Rick Fienberg
Nimish P. Hathi
Joshua Ridley
Daniel Wolf Savin

**Session Numbering Key**
100’s Monday and LAD Posters
200’s Tuesday
300’s Wednesday
400’s Thursday

Sessions are numbered in the Program Book by day and time.
Changes after 7 May are included only in the online program materials.

Follow us on Twitter #aas222
**AAS Officers & Councilors**

* New AAS Officers and Councilors begin their terms after the AAS Members’ Meeting on 5 June 2013 at the Indianapolis meeting.

**Officers**

President (2012-2014)  
**David J. Helfand** Quest Univ. Canada

President-Elect (2013-2014)  
* **C. Megan Urry** Yale Univ.

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**Debra M. Elmegreen** Vassar College

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**Nicholas B. Suntzeff** Texas A&M Univ.

Vice-President (2011-2014)  
**Edward B. Churchwell** Univ. of Wisconsin

Vice-President (2012-2015)  
**Paula Szkody** University of Washington.

Vice-President (2013-2016)  
* **Chryssa Kouveliotou** NASA/MSFC

Treasurer (2011-2014)  
**Hervey (Peter) Stockman** STScI

Secretary (2010-2016)  
**G. Fritz Benedict** Univ. of Texas, Austin

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**Anne P. Cowley** Arizona State Univ.

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**Edward E. Prather** Univ. of Arizona

Executive Officer (2006-Present)  
**Kevin B. Marvel** AAS
Councilors

2010-2013
Edward F. Guinan  Villanova Univ.
Pattica Knezek  NOAO/WIYN Observatory
Robert Mathieu  Univ. of Wisconsin

2011-2014
Bruce Balick  Univ. of Washington
Eileen D. Friel  Indiana Univ.
Angela Speck  Univ. of Missouri

2012-2015
Nancy S. Brickhouse  Harvard-Smithsonian, CfA
Todd J. Henry  Georgia State Univ.
Steven D. Kawaler  Iowa State Univ.

2013-2016
Geoffrey Clayton  Louisiana State Univ.
* Dara J. Norman  NOAO
* Dawn M. Gelino  Caltech

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Press Officer (2010-Present)
Rick Fienberg  AAS

Deputy Press Officer
Inge Heyer  Loyola University Maryland

Deputy Press Officer
Larry Marschall  Gettysburg College
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215  Korea Astronomy and Space Science Institute
201  NRAO
107  NEXSci/Kepler
102  Pearson
200  SOFIA
209  Space Telescope Science Institute
112  Springer
206  National Optical Astronomy Observatory
208  TMT Observatory Corp

SHARED BOOK EXHIBITORS
University of Arizona Press
Hadrosaur Press
Attendee Services

For everyone’s protection, please wear your badge at all times during the meeting.

Registration

Wabash East, Indiana Convention Center
Sunday: 3:00-8:00pm
Monday: 7:30am-5:00pm
Tuesday-Wednesday: 8:00am-5:00pm
Thursday: 8:00am-12:00pm

Amateur One Day Registration (Monday or Tuesday)

We welcome amateur astronomers to the AAS Meeting for a one day ‘taste of of the AAS’ in Indianapolis. For these days we invite our guests to attend all the oral and poster sessions, peruse our exhibit hall and attend special open talks designed for general audiences. We hope that you will take the time to attend one of these talks and spend some time engaging with these astronomy enthusiasts.

Open Event: Hubble Space Telescope Astrometry - Still Useful, After All These Years
Monday: 9:30am-10:00am
Fritz Benedict, University of Texas

Interstellar Destinations
Monday: 1:30pm-2:00pm
Ed Guinan, Villanova University

A Glimpse of Galaxies at the Dawn of the Universe
Tuesday: 9:30am-10:00am
Debra Elmegreen, Vassar College

Pluto’s Demise and Resurrection
Tuesday: 1:30am-2:00pm
Angela Speck, University of Missouri

Exhibit Hall

You must have your badge to enter the Exhibit Hall

Monday-Tuesday: 9:00am-6:30pm
Wednesday: 9:00am-7:00pm
Thursday: 9:00am-12:00pm

Please do not leave personal items unattended. The AAS is not responsible for lost or stolen property.

Posters not removed by closing times will be recycled.
Exhibit Hall Events

Morning Coffee Break
Monday-Thursday, 9:30am-10:00am

Evening Poster Session with cash bar
Monday-Tuesday, 5:30pm-6:30pm
Wednesday, 5:30pm-7:00pm

Student Education Outreach Event
Tuesday 11:30am-2:00pm

Closing Reception with light refreshments and raffle drawings.
Wednesday, 5:30pm-7:00pm

Speaker Ready Room
Room 109, Indiana Convention Center
Sunday: 3:00-5:00pm
Monday: 7:30am-4:00pm
Monday-Wednesday: 7:30am-4:00pm
Thursday: 7:30am-11:00am

Cyber Café - Sponsored by Northrop Grumman
Exhibit Hall D
Monday-Tuesday: 9:00am-6:30pm
Wednesday: 9:00am-7:00pm
Thursday: 9:00am-12:00pm

If there is a line for computers, please limit your time to 15 minutes.
Absolutely no food or drink is permitted in the Cyber Café.

Using Your Own Laptop While At The Meeting

- All devices are required to be running the most up-to-date virus and spyware protection.
- No device should be running as a server for off site clients.
- Absolutely no routers can be attached to the network without prior authorization from the AAS IT Staff.
- The network will be monitored throughout the Meeting and the AAS Staff reserves the right to disconnect any device that is causing network problems.

Wireless will be available throughout the entire meeting space although some areas may experience limited connectivity. To access the Internet through the AAS wireless network, users will need to connect to any of the AAS access points and log in with the username and password printed on the back of your badge. Please note that the wireless is not encrypted.

Donor and Sponsor Lounge
Attendance by Invitation Only
Room 112, Indiana Convention Center
Monday-Wednesday: 7:30am-5:30pm
Thursday: 7:30am-12:30pm
### Schedule of Events

#### Saturday, 1 June 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:00am</td>
<td>CAE’s Tier I Teaching Excellence Workshop for Current and Future Astronomy and Space Science Instructors: A Two-Day Workshop, 9:00am-5:30pm, Capitol 1 (Westin Indianapolis)</td>
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</table>

#### Sunday, 2 June 2013

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<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
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<tr>
<td>10:00am</td>
<td>Volunteer Orientation, 10:00am-11:00am, Room 107</td>
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<tr>
<td>3:00pm</td>
<td>Speaker Ready Room, 3:00pm-5:00pm, Room 109</td>
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<tr>
<td>6:00pm</td>
<td>Undergraduate Orientation Reception, 6:00pm-7:00pm, Grand Ballroom 1 (Westin Indianapolis)</td>
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<tr>
<td>7:00pm</td>
<td>AAS Opening Reception, 7:00pm-9:00pm, Grand Ballroom 5 (Westin Indianapolis)</td>
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### Monday, 3 June 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:30am</td>
<td>Session Chair Breakfast, 7:30am-8:00am, Room 107</td>
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<td></td>
<td>Speaker Ready Room, 7:30am-4:00pm, Room 109</td>
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<td>Registration, 7:30am-5:00pm, Wabash East Lobby</td>
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<tr>
<td>8:00am</td>
<td><strong>100 Plenary Session:</strong> Welcome Address by AAS President David Helfand, 8:00am-8:30am, Wabash Ballroom 1</td>
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<tr>
<td>8:30am</td>
<td><strong>101 Plenary Session:</strong> Kavli Foundation Lectureship: The Search for Habitable Worlds, David Latham (Harvard-Smithsonian, CfA), 8:30am-9:20am, Wabash Ballroom 1</td>
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<tr>
<td>9:00am</td>
<td>Exhibit Hall, 9:00am-6:30pm</td>
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<td>Café, 9:00am-6:30pm, Exhibit Hall D</td>
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<td>Posters, 9:00am-6:30pm, Exhibit Hall D</td>
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<tr>
<td></td>
<td>114 Laboratory Astrophysics</td>
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<td>115 Binaries, Variable Stars and White Dwarfs</td>
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<td>116 Stars, Stellar Evolution and Atmospheres, Circumstellar Disks</td>
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<td>117 Young Stellar Objects, Star Formation, and Star Clusters</td>
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<td>118 Supernovae and Supernova Remnants</td>
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<td>119 Cosmology and Associated Topics</td>
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<td>120 Astronomy Education &amp; Public Outreach</td>
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<tr>
<td>9:30am</td>
<td>Amateur Day Talk: Hubble Space Telescope Astrometry - Still Useful, After All These Years, G. Fritz Benedict (University of Texas, Austin), 9:30am-10:00am, Room 116</td>
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<td></td>
<td>Coffee Break, 9:30am-10:00am, Exhibit Hall D</td>
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<td>10:00am</td>
<td>Oral, Special, and Meeting-in-a-Meeting Sessions 102-105, 10:00am-11:30am</td>
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<td>102 Bridging Laboratory and Astrophysics: Atoms</td>
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<td>103 Cosmology and Associated Topics</td>
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<td>Wabash Ballroom 3</td>
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<td>104 University of Arizona Astronomy Club</td>
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<td>105 WIYN Observatory - Building on the Past, Looking to the Future: Groundbreaking Science and Education</td>
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<td>Wabash Ballroom 1</td>
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<td>11:40am</td>
<td><strong>106 Plenary Session:</strong> SPD Hale Prize Lecture: Twisting and Writhing with George Ellery Hale, Richard Canfield (Montana State University), 11:40am-12:30pm, Wabash Ballroom 1</td>
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<tr>
<td>12:45pm</td>
<td><strong>107 Town Hall:</strong> NSF Town Hall, 12:45pm-1:45pm, Wabash Ballroom 3</td>
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<td>1:30pm</td>
<td>Amateur Day Talk: Interstellar Destinations, Ed Guinan (Villanova University), 1:30pm-2:00pm, Room 116</td>
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<td>2:00pm</td>
<td>Oral, Special, and Meeting-in-a-Meeting Sessions 108-111, 2:00pm-3:30pm</td>
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<td>108 Astronomy Education: Where Are We Now and Where Are We Going?</td>
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<td>109 Bridging Laboratory &amp; Astrophysics: Molecules</td>
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<td>110 Interstellar Medium, Dust, Etc.</td>
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<td>Wabash Ballroom 3</td>
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<td>111 WIYN Observatory - Building on the Past, Looking to the Future: pODI and Instrumentation Wabash Ballroom 1</td>
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<tr>
<td>3:40pm</td>
<td><strong>112 Plenary Session:</strong> The Secret Life of Globular Clusters, Catherine Pilachowski (Indiana University), 3:40pm-4:30pm, Wabash Ballroom 1</td>
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<td>4:30pm</td>
<td><strong>113 Plenary Session:</strong> Supernovae and Their Diversity, Peter Garnavich (University of Notre Dame), 4:30pm-5:20pm, Wabash Ballroom 1</td>
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<td>5:30pm</td>
<td>Evening Poster Session, 5:30pm-6:30pm, Exhibit Hall D</td>
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<td>6:30pm</td>
<td>LGBTIQ Networking Dinner, 6:30pm-8:30pm, Meet at AAS Registration Desk</td>
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<td>9:00pm</td>
<td>Star Party with the Indiana Astronomical Society, 9:00pm, Convention Center Plaza – Corner of South Capitol Ave. and West Maryland St.</td>
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<td>7:30am</td>
<td>Speaker Ready Room, 7:30am-4:00pm, Room 109</td>
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<td>8:00am</td>
<td>Registration, 8:00am-5:00pm, Wabash East Lobby</td>
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<td>8:30am</td>
<td><strong>200 Plenary Session:</strong> SPD Harvey Prize Lecture: Modeling Solar Eruptions: Where Do We Stand?, Tibor Torok (Predictive Science, Inc.), 8:30am-9:20am, Wabash Ballroom 1</td>
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<td>Exhibit Hall, 9:00am-6:30pm</td>
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<td>Cyber Café, 9:00am-6:30pm, Exhibit Hall D</td>
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<td><strong>Posters:</strong> 9:00am-6:30pm, Exhibit Hall D</td>
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<td>114 Laboratory Astrophysics</td>
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<td>214 WIYN Observatory - Building on the Past, Looking to the Future</td>
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<td>215 AGN, OSO, Blazars</td>
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<td>216 The ISM and Objects Therein</td>
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<td>217 Extrasolar Planets &amp; Tools</td>
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<td>218 Pulsars and Neutron Stars</td>
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<tr>
<td>9:30am</td>
<td>Amateur Day Talk: A Glimpse of Galaxies at the Dawn of the Universe, Debra Elmegreen (Vassar College), 9:30am-10:00am, Room 116</td>
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<td>Coffee Break, 9:30am-10:00am, Exhibit Hall D</td>
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<td>10:00am</td>
<td>**Oral, Special, and Meeting-in-a-Meeting Sessions 201-204, 10:00am-11:30am</td>
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<tr>
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<td>201 Astronomy Education &amp; Public Outreach Room 116</td>
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<td>202 Bridging Laboratory and Astrophysics: Dust and Ices Room 117</td>
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<td>203 Outer Limits of the Milky Way I: Overview and Theories of Galactic Structure Wabash Ballroom 3</td>
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<td>204 WIYN Observatory - Building on the Past, Looking to the Future: Partnerships Wabash Ballroom 1</td>
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<tr>
<td>11:30am</td>
<td>Open Event: Education and Public Outreach Student Event, 11:30am-2:00pm, Exhibit Hall D</td>
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<tr>
<td>11:40am</td>
<td><strong>205 Plenary Session:</strong> The Atacama Large Millimeter/submillimeter Array: A New Window on the Universe, Anthony Beasley (NRAO), 11:40am-12:30pm, Wabash Ballroom 1</td>
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<tr>
<td>12:30pm</td>
<td>Proposal and Observing Prep with NRAO Telescopes, 12:30pm-3:30pm, Room 107</td>
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<td>12:45pm</td>
<td><strong>206 Town Hall:</strong> NASA Town Hall, 12:45pm-1:45pm, Wabash Ballroom 1</td>
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<td>207 Town Hall: CSWA Town Hall: Unconscious Bias, Stereotype Threat, and Imposter Syndrome, 12:45pm-1:45pm, Wabash Ballroom 3</td>
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<td>1:30pm</td>
<td>Amateur Day Talk: Pluto’s Demise and Resurrection, Angela Speck (University of Missouri), 1:30pm-2:00pm, Room 116</td>
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<td>2:00pm</td>
<td>**Oral, Special, and Meeting-in-a-Meeting Sessions 208-211, 2:00pm-3:30pm</td>
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<td>208 Galaxies and AGN I Wabash Ballroom 1</td>
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<td>209 Supernovae and Neutron Stars Room 116</td>
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<td>210 Bridging Laboratory and Astrophysics: Plasmas Room 117</td>
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<td>211 Outer Limits of the Milky Way II: Star Formation Wabash Ballroom 3</td>
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<td>3:40pm</td>
<td><strong>212 Plenary Session:</strong> Computation as a Bridge between the Laboratory and Astrophysics, Fausto Caltaneo (University of Chicago), 3:40pm-4:30pm, Wabash Ballroom 1</td>
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<td>4:30pm</td>
<td><strong>213 Plenary Session:</strong> The X-ray Background and the Cosmic History of Black Hole Growth, Guenther Hasinger (University of Hawaii), 4:30pm-5:20pm, Wabash Ballroom 1</td>
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<td>5:30pm</td>
<td><strong>Evening Poster Session:</strong> 5:30pm-6:30pm, Exhibit Hall D</td>
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<td>8:00pm</td>
<td>Public Event: Discovering Planets From Your Sofa: Adventures in Citizen Science, Chris Lintott (University of Oxford), 8:00pm-9:00pm, Wabash Ballroom 1</td>
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<td>7:30am</td>
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<td>Speaker Ready Room, 7:30am-4:00pm, Room 109</td>
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<tr>
<td>8.00am</td>
<td>Registration, 8:00am-5:00pm, Wabash East Lobby</td>
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<td>8.00am</td>
<td><strong>300 Plenary Session:</strong> The Latest Results from the NASA Kepler Mission: Exoplanets and Astrophysics, Steve Howell (NASA ARC), 8:30am-9:20am, Wabash Ballroom 1</td>
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<td>9:00am</td>
<td>Exhibit Hall, 9:00am-7:00pm</td>
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<td>Cyber Café, 9:00am-7:00pm, Exhibit Hall D</td>
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<td><strong>Posters, 9:00am-7:00pm, Exhibit Hall D</strong></td>
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<td>301 Bridging Laboratory and Astrophysics: Planetary</td>
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<td>302 Extrasolar Planets &amp; Tools Wabash Ballroom 1</td>
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<td>303 Outer Limits of the Milky Way III: Mapping Galactic Structure in Stars and Dust Wabash Ballroom 3</td>
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<td>316 Instrumentation: Space Missions</td>
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<td>317 Stellar Evolution</td>
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<td>318 Galaxy Observations</td>
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<td>9:30am</td>
<td>Coffee Break, 9:30am-10:00am, Exhibit Hall D</td>
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<td>10:00am</td>
<td><strong>Oral, Special, and Meeting-in-a-Meeting Sessions 301-304, 10:00am-11:30am</strong></td>
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<td>306 Town Hall: LAD Business Meeting, 12:45pm-1:45pm, Room 117</td>
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<tr>
<td>11:40am</td>
<td><strong>305 Plenary Session:</strong> Recent Advances in Our Understanding of Star Formation, Bruce Elmegreen (IBM Research Division), 11:40am-12:30pm, Wabash Ballroom 1</td>
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<td>12:45pm</td>
<td><strong>307 Town Hall:</strong> New Strategic Framework: NOAO, 12:45pm-1:45pm, Wabash Ballroom 3</td>
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<td>2:00pm</td>
<td><strong>Oral, Special, and Meeting-in-a-Meeting Sessions 308-110, 2:00pm-3:30pm</strong></td>
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<td>308 Bridging Laboratory &amp; Astrophysics: Nuclear</td>
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<td>309 Galaxies and AGN II Wabash Ballroom 1</td>
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<td>310 Young Stellar Objects, Star Formation and Star Clusters Wabash Ballroom 3</td>
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<tr>
<td>3:40pm</td>
<td><strong>311 Plenary Session:</strong> Curiosity on Mars: The Latest Results from an Amazing Mission, Dawn Sumner (University of California, Davis), 3:40pm-4:30pm, Wabash Ballroom 1</td>
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<tr>
<td>4:30pm</td>
<td><strong>AAS Members Meeting,</strong> 4:30pm-5:30pm, Wabash Ballroom 1</td>
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<tr>
<td>5:30pm</td>
<td><strong>AAS Closing Reception &amp; Evening Poster Session, 5:30pm-7:00pm, Exhibit Hall D</strong></td>
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<td>7:30am</td>
<td>Speaker Ready Room, 7:30am-11:00am, Room 109</td>
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<td>8:00am</td>
<td>Registration, 8:00am-12:00pm, Wabash East Lobby</td>
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<td>8:00am</td>
<td><strong>400 Plenary Session</strong>: Current Perspectives on the Spiral Structure of the Milky Way, Thomas Dame (Harvard-Smithsonian, CfA), 8:30am-9:20am, Wabash Ballroom 1</td>
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<td>9:00am</td>
<td>Exhibit Hall, 9:00am-12:00pm</td>
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<td>9:30am</td>
<td>Cyber Café, 9:00am-12:00pm, Exhibit Hall D</td>
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<td><strong>Posters, 9:00am-12:00pm, Exhibit Hall D</strong></td>
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<td>9:00am</td>
<td>114 Laboratory Astrophysics</td>
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<td>9:00am</td>
<td>313 Outer Limits of the Milky Way</td>
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<td>9:00am</td>
<td>314 Evolution of Galaxies</td>
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<td>9:00am</td>
<td>315 Ground Based, Airborne Observations</td>
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<td>9:30am</td>
<td>Coffee Break, 9:30am-10:00am, Exhibit Hall D</td>
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<td>10:00am</td>
<td><strong>Oral, Special, and Meeting-in-a-Meeting Sessions 401-403, 10:00am-11:30am</strong></td>
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<td>10:00am</td>
<td><strong>401 Bridging Laboratory and Astrophysics:</strong></td>
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<tr>
<td>10:00am</td>
<td>Particles, Room 117</td>
</tr>
<tr>
<td>10:00am</td>
<td><strong>402 Instrumentation, Data Handling, Surveys</strong></td>
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<tr>
<td>10:00am</td>
<td>Wabash Ballroom 3</td>
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<tr>
<td>10:00am</td>
<td><strong>403 Stellar Evolution and Binary Stars</strong></td>
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<tr>
<td>10:00am</td>
<td>Wabash Ballroom 1</td>
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<tr>
<td>11:40am</td>
<td><strong>304 Plenary Session</strong>: The Bridged Gap; Transients in the Local Universe, Mansi Kasliwal (Carnegie Institution for Science), 11:40am-12:30pm, Wabash Ballroom 1</td>
</tr>
</tbody>
</table>
A GUIDE TO AAS MEETING ETIQUETTE

AAS meetings are the largest and most logistically complex astronomy meetings in the world. We ask all attendees to work together to enhance the value of the meetings by keeping in mind the following points.

Executive Summary

• Do obey the “golden rule”: Treat others as you would like them to treat you.
• Do silence all cell phones and other electronic devices with audible alerts.
• Do not hog wireless bandwidth; use the AAS wireless service sparingly.
• Do be quiet during presentations; if you use a computer, do so discreetly.
• Do not panic if reporters attend your talk on results under journal embargo.
• Do pick up after yourself by depositing trash in the appropriate receptacles.
• Do not blog or tweet or otherwise post private conversations online.

General Considerations

It is AAS policy that all participants in Society activities will enjoy an environment free from all forms of discrimination, harassment, and retaliation. As a professional society, the AAS is committed to providing an atmosphere that encourages the free expression and exchange of scientific ideas. The AAS is dedicated to the philosophy of equality of opportunity and treatment for all members and other meeting attendees, regardless of gender, race, ethnic origin, religion, age, marital status, sexual orientation, disabilities, or any other reason not related to scientific merit. Harassment, sexual or otherwise, is a form of misconduct that undermines the integrity of Society meetings. Violators will be subject to discipline. (Full AAS anti-harassment policy: http://aas.org/policies/anti-harassment-policy).

AAS meeting staff are trained professionals, expert at organizing and conducting scientific meetings. They work with professional contractors who specialize in providing audio-visual, security, and other services, and with professional hotel and convention-center staff as well. Meeting attendees are professional scientists, expert at carrying out scientific research and presenting that research at meetings. Accordingly, please be respectful of all meeting staff and contractors, just as they respect you as an attendee and scientist. Attendees who are notably disrespectful or who act in an unprofessional manner toward meeting staff, contractors, other attendees, or hotel or convention center staff will be required to leave the meeting.

Please note that all sessions except those marked “private” by the AAS are open to all registered attendees, including scientists, students, and journalists. All are due the same level of professional respect and courtesy.

Mobile Phones & Related Devices

Mobile phones, pagers, and similar electronic devices should be silenced. Before each session begins and before you enter an active session, please silence your mobile phone and any other devices that have audible alerts. Switching phones to vibrate rather than ring is not sufficient, as the vibrations can be heard or felt by those nearby.

Do not dial or take a phone call during a session. Please exit the session room before beginning or answering a call. All modern mobile phones have caller-ID and call-back features — please make use of them.
Computers & Internet Service

The AAS provides wireless Internet service throughout each meeting, but we cannot guarantee full coverage in all locations. We provide priority access in the common areas. This means you may experience limited connectivity in the session rooms.

If you do make use of wireless Internet access during a presentation, or even if you are just taking notes on your computer, please keep your activities as quiet as possible so as to minimize distractions to other attendees and the speaker. If you must use a computer during a session, please consider sitting near the back of the room so as not to distract the speaker or session chair. These same guidelines apply to mobile phones, tablets, and other electronic devices.

One of the cost drivers for meeting registration is provision of adequate bandwidth, which — believe it or not — costs tens of thousands of dollars per meeting. Excessive downloading or uploading of files, software updates, streaming video, and other bandwidth-hungry activities (e.g., gaming, exploring virtual worlds) increases the costs for all attendees. The AAS reserves the right to ban excessive users from its meeting network and to use site blocking, port blocking, and traffic shaping to ensure adequate bandwidth for all.

Sessions & Questions

If you are giving a presentation, please be sure you have read the speaker and AV instructions on the AAS website (http://aas.org/meetings/av_information.php). All oral presentations must be uploaded to the internal network in the Speaker Ready Room. Personal laptops and USB member drives will not be permitted for presentations in session rooms. We ask that you upload your presentation at least 24 hours in advance. Be sure to show up at your session on time.

The session chair is in charge of the session. He or she is empowered to stop questioning and to rearrange or otherwise adjust time slots (or not) based on tardiness or non-attendance of a scheduled speaker. The chair cannot end talk times beyond the common limits of 10 minutes for regular contributions and 20 minutes for dissertation contributions (including time allotted for Q&A).

When asking questions of speakers, please be professional, courteous, and polite. This is especially important when questioning students presenting their dissertation research. Be considerate of other people wishing to ask questions. If you have multiple or detailed questions, speak with the presenter after the session.

Journalists & Embargoes

If your presentation covers results that have been, or will be, submitted to Nature or Science or any other journal with a strict embargo policy, be sure you understand how that policy applies to scientific meetings. No journal wishes to hinder communication between scientists. For example, both Science and Nature state explicitly that conference presentations do not violate their embargo policies.

But both journals also state that if your presentation covers work that has been, or will be, submitted to them, you should limit your interaction with reporters to clarifying the specifics of your presentation. As Science puts it, “We ask that you do not expand beyond the content of your talk or give copies of the paper, data, overheads, or slides to reporters.” That does not mean you should be rude if a reporter asks you for such materials or poses a question that you do not want to answer — just explain that your results are under embargo at Science or Nature, and the reporter will understand why you cannot be more forthcoming.
Photography & Video

Many events and presentations at AAS meetings are recorded for posterity by a Society photographer. Some sessions, and all press conferences, are videotaped and eventually posted on the AAS members website as a member benefit. Your attendance at an AAS meeting signifies your agreement to be photographed or videotaped in the course of normal meeting business. Invited and prize lecturers will be asked to sign a form for legal clarity.

If you take pictures during the meeting, please be considerate of others. Do not use a flash when taking pictures during sessions.

Eating, Drinking & Smoking

Because our meetings are so full of great content, it can be hard to find time to eat breakfast or lunch. If you must eat or drink while attending a session, please do so quietly and be sure to deposit your trash properly after the session ends. Additional cleaning services costs the AAS money and increases registration costs.

Some venues have strict policies against eating or drinking in particular areas. Meeting attendees are expected to follow these policies. Attendees may not bring their own alcoholic beverages or drink them at the meeting venue outside of areas or times when they are sold. Obviously, this does not apply to bars, restaurants, or other facilities co-located with our meeting venues.

AAS meetings are strictly non-smoking, consistent with laws in the localities where we hold our conferences. When possible, smoking areas will be clearly identified.

Blogging & Tweeting

If you blog, tweet, or otherwise post near-real-time material from the meeting online, you must follow the guidelines above concerning the use of computers, tablets, mobile phones, and AAS wireless bandwidth.

Please do not publicly report private conversations — only scheduled presentations and public comments are fair game for blogging, tweeting, etc.

Remember that many presentations at AAS meetings concern work that has not yet been peer-reviewed. So think twice before posting a blog entry or tweet that is critical of such work. It is helpful to receive constructive criticism during the Q&A after your talk or while standing next to your poster, but it is hurtful to be raked over the coals online before your session is even over and with no easy way to respond.

*New York Times* editor Bill Keller said it well. When it comes to meetings among colleagues, he explained, “We need a zone of trust, where people can say what’s on their minds without fear of having an unscripted remark or a partially baked idea zapped into cyberspace. Think of it as common courtesy.”
New and Featured Books in Astronomy and Astrophysics!

New Edition!

**The Cosmos**
*Astronomy in the New Millennium*

Jay M. Pasachoff  
*Williams College, Massachusetts*

Alex Filippenko  
*University of California, Berkeley*

An exciting introduction to astronomy, the fourth edition of this text uses recent discoveries and stunning photography to inspire non-science majors about the universe and science. Written by two highly experienced and engaging instructors, each chapter has been fully updated, with more than 200 new images throughout from space missions and the world’s best observatories.

Price: $85.00

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Browse the 2013 Astrophysics and Cosmology Online Catalog at  
www.cambridge.org/us/astronomy

**Understanding the Universe**
*An Inquiry Approach to Astronomy and the Nature of Scientific Research*

George Greenstein  
*Amherst College, Massachusetts*

Price: $65.00

**Astrophysics through Computation**
*With Mathematica® Support*

Brian Koberlein  
*Rochester Institute of Technology, New York*

David Meisel  
*State University of New York, Geneseo*

Price: $70.00

**Discovery and Classification in Astronomy**
*Controversy and Consensus*

Steven J. Dick  
Price: $45.00

**Winner of the 2012 PROSE Award for Cosmology and Astronomy**

**Modern Statistical Methods for Astronomy**
*With R Applications*

Eric D. Feigelson  
*Pennsylvania State University*

G. Jogesh Babu  
*Pennsylvania State University*

Price: $90.00

Prices subject to change.
CAE’s Tier I Teaching Excellence Workshop for Current and Future Astronomy and Space Science Instructors: A Two-Day Workshop

Saturday, 9:00 AM - 5:30 PM, Capitol 1, Westin Indianapolis

Are you a current or future instructor teaching Earth, Astronomy, or Space Science? Would you like your classroom to actively engage your students in discourse about the big ideas of your class; how evidence is used to understand the universe; and the role of science in society? We invite you to come to our CAE Teaching Excellence Workshop. Spend time with your colleagues becoming an effective implementor of active-learning instructional strategies. Learn how to transform your classroom into a vibrant learning environment that will: (1) increase students’ conceptual understandings; (2) improve their abilities to think critically, interpret graphs, and reason about quantitative data; (3) motivate them to actively engage in their learning; and (4) improve their self-efficacy. Our Tier I Teaching Excellence Workshop will provide you with the experiences you need to create effective and productive active-learning classroom environments. We will model best practices in implementing many different classroom-tested instructional strategies. But most importantly, you and your workshop colleagues will gain first-hand experience implementing these strategies yourselves. During our many microteaching events, you’ll have the opportunity to role-play the parts of student and instructor. You’ll assess and critique each other’s implementation in real-time, as part of a supportive learning community. You’ll have the opportunity to face and conquer your fears of unfamiliar teaching in collaboration with kind and gentle friends and mentors before you try them by yourself in front of your students. Workshop topics will include: creating inclusive classroom environments; strategies to improve retention & diversity of STEM majors & grads; collaborative group learning; interactive lectures, demonstrations, and videos; effective use of writing; Think-Pair-Share (Peer Instruction, Clicker Questions); Lecture-Tutorials; Ranking Tasks; assessment strategies (including homework, grading, and exams). Presented by Edward Prather and Gina Brissenden (Steward Observatory, Univ. of Arizona). (Day 1 of 2)
CAE’s Tier I Teaching Excellence Workshop for Current and Future Astronomy and Space Science Instructors: A Two-Day Workshop

Sunday, 8:00 AM - 5:30 PM, Capitol 1, Westin Indianapolis

Are you a current or future instructor teaching Earth, Astronomy, or Space Science? Would you like your classroom to actively engage your students in discourse about the big ideas of your class; how evidence is used to understand the universe; and the role of science in society? We invite you to come to our CAE Teaching Excellence Workshop. Spend time with your colleagues becoming an effective implemenor of active-learning instructional strategies. Learn how to transform your classroom into a vibrant learning environment that will: (1) increase students’ conceptual understandings; (2) improve their abilities to think critically, interpret graphs, and reason about quantitative data; (3) motivate them to actively engage in their learning; and (4) improve their self-efficacy. Our Tier I Teaching Excellence Workshop will provide you with the experiences you need to create effective and productive active-learning classroom environments. We will model best practices in implementing many different classroom-tested instructional strategies. But most importantly, you and your workshop colleagues will gain first-hand experience implementing these strategies yourselves. During our many microteaching events, you’ll have the opportunity to role-play the parts of student and instructor. You’ll assess and critique each other’s implementation in real-time, as part of a supportive learning community. You’ll have the opportunity to face and conquer your fears of unfamiliar teaching in collaboration with kind and gentle friends and mentors before you try them by yourself in front of your students. Workshop topics will include: creating inclusive classroom environments; strategies to improve retention & diversity of STEM majors & grads; collaborative group learning; interactive lectures, demonstrations, and videos; effective use of writing; Think-Pair-Share (Peer Instruction, Clicker Questions); Lecture-Tutorials; Ranking Tasks; assessment strategies (including homework, grading, and exams). Presented by Edward Prather and Gina Brissenden (Steward Observatory, Univ. of Arizona). (Day 2 of 2)

Undergraduate Orientation Reception

Sunday, 6:00 PM - 7:00 PM, Grand Ballroom 1, Westin Indianapolis

Undergraduate students, their advisors and those interested in attracting undergraduate students to their graduate program, or undergraduate research opportunity are invited to attend this event. Members of the AAS Council and of the Astronomy Education Board will be there to meet and chat with students. For the benefit of those students attending an AAS meeting for the first time, we will explain how to get the most out of an AAS meeting and outline how the meeting works. Sign up, free of charge to all undergrads, their advisors and those offering research opportunities (or jobs) to undergraduates, through the meeting registration form. Light snacks and refreshments will be provided.

Chair
Edward E. Prather¹
¹Center for Astronomy Education (CAE) Univ. of Arizona

AAS Opening Reception

Sunday, 7:00 PM - 9:00 PM, Grand Ballroom 5, Westin Indianapolis

Open to all attendees, the Opening Reception kicks off the 222nd meeting of the American Astronomical Society.


Session Chair Breakfast

Monday, 7:30 AM - 8:00 AM, Room 107, Indiana Convention Center

100 Welcome Address

Monday, 8:00 AM - 8:30 AM, Wabash Ballroom 1, Indiana Convention Center
Chair
David J. Helfand
1Quest University Canada

Invited Session101 Kavli Foundation Lectureship: The Search for Habitable Worlds

Monday, 8:30 AM - 9:20 AM, Wabash Ballroom 1, Indiana Convention Center
Chair
David J. Helfand
1Quest University Canada

About The Kavli Foundation
The Kavli Foundation is dedicated to advancing science for the benefit of humanity, promoting public understanding of scientific research, and supporting scientists and their work. The Foundation's mission is implemented through an international program of research institutes in the fields of astrophysics, nanoscience, neuroscience and theoretical physics, and through the support of conferences, symposia, endowed professorships and other activities. The Foundation is also a founding partner of the biennial Kavli Prizes, which recognize scientists for their seminal advances in three research areas: astrophysics, nanoscience and neuroscience. Based in Southern California, the Foundation was founded by its Chairman, philanthropist and entrepreneur Fred Kavli. Fred Kavli is the founder, former chairman and former chief executive officer of Kavlico Corp. He led the company to prominence to become one of the world’s largest suppliers of sensors for aeronautics, automotive and industrial applications before he sold it in 2000 and established The Kavli Foundation.

The Search for Habitable World
The American Astronomical Society hereby recognizes David W. Latham as the Kavli Lecturer for the 222nd Meeting of the Society for his pioneering work in the search for habitable worlds, including instigation of the HARPS-N Collaboration that can coordinate spectroscopy with transit photometry in the Kepler field, analysis of current Kepler data, and plans for rocky planet searches and spectroscopy of exoplanet atmospheres.

101.01 The Search for Habitable Worlds
David W. Latham
1Harvard-Smithsonian, CfA
Open Event: Hubble Space Telescope Astrometry - Still Useful, After All These Years

Monday, 9:30 AM - 10:00 AM

Organizer
Fritz Benedict¹
¹University of Texas

Fun with exoplanets; component masses and planetary system architecture, and why anybody cares.
What happens when things don’t work out as planned?
I’ll review a triumph, a potential ‘failure’ redeemed, and a work in progress that cannot yet be tagged a disaster.
How do we turn disaster into triumph? Do we always?
Hey! If this stuff was easy, anybody would do it!

102 Bridging Laboratory and Astrophysics: Atoms

Monday, 10:00 AM - 11:30 AM, Room 117, Indiana Convention Center

Laboratory astrophysics is the Rosetta Stone that enables astronomers to understand and interpret the cosmos. This session will focus on the interplay between astrophysics with theoretical and experimental studies into the underlying atomic processes which drive our Universe.

Chair
Daniel W. Savin¹
¹Columbia Astrophysics Lab

102.01 Atomic Data Applications for Supernova Modeling
Christopher J. Fontes¹
¹Los Alamos National Laboratory

102.02 Photoionized Plasmas in the Z Facility and in Astrophysics
Roberto Mancini¹
¹University of Nevada, Reno

102.03 Spectroscopic Measurements of Collision-less Coupling Between Laser-Produced, Super-Alfvénic Debris Plasmas and Magnetized, Ambient Plasmas
Anton Bondarenko¹, E. Everson¹, D. Schaeffer¹, C. Constantin¹, S. Vincena¹, B. Van Compernolle¹, S. Clark¹, C. Niemann¹
¹University of California at Los Angeles

103 Cosmology and Associated Topics

Monday, 10:00 AM - 11:30 AM, Wabash Balloom 3, Indiana Convention Center

Chair
Debra Elmegreen¹
¹Vassar College

103.01 Cosmic Microwave Background Polarization Measurements from Three Years of BICEP Observations
Immanuel Buder¹, BICEP Collaboration
¹Harvard-Smithsonian Center for Astrophysics

103.02D New Techniques in Dark Matter Mapping
Suzanne Lorenz¹, J.R. Peterson¹
¹Purdue University
Evidence for Supporting the Black Hole Universe Model
Tianxi Zhang¹
¹Alabama AandM University

Bayesian Analysis of Systematic Effects in Interferometric Observations of the Cosmic Microwave Background Polarization
Ata Karakci¹, L. Zhang², P.M. Sutter³, E.F. Bunn⁴, A. Korotkov⁵, P.T. Timbie⁶, G.S. Tucker⁹, B. Wandelt⁷
¹Brown University, ²University of Wisconsin, ³University of Illinois at Urbana-Champaign, ⁴University of Richmond, ⁵Institut d'Astrophysique de Paris, France

Eclipsing Binaries as Accurate Extragalactic Distance Indicators: Refining the Distance to the Triangulum Spiral Galaxy M33
Edward F. Guinan¹, A. Prsa¹, E.L. Fitzpatrick¹, A.Z. Bonanos², S.G. Engle³, E.J. Devinney¹, G. Recker¹
¹Villanova University, ²National Observatory of Athens, Greece

104 University of Arizona Astronomy Clu
Monday, 10:00 AM - 11:30 AM, Room 116, Indiana Convention Center

Chair
Gina Brissenden¹
¹Center for Astronomy Education (CAE) Univ. of Arizona

The University of Arizona’s Astronomy Club: Overview and Goals
Jake Turner¹, K. Hardegree-Ullman¹, A.P.M. Towner¹, A. Walker-LaFollette¹, A.M. McGraw¹, L.I. Biddle¹, A. Robertson¹, C. Smith¹
¹University of Arizona

Research Projects and Undergraduate Retention at the University of Arizona
Amanda Walker-LaFollette¹, K. Hardegree-Ullman¹, A.P.M. Towner¹, A.M. McGraw¹, L.I. Biddle¹, A. Robertson¹, J. Turner¹, C. Smith¹
¹University of Arizona, ²University of Toledo

The Benefits of Peer-Mentoring in Undergraduate Group Research Projects at The University of Arizona
Kevin Hardegree-Ullman¹, ², A.M. McGraw², A.P.M. Towner², A. Walker-LaFollette², A. Robertson², C. Smith², J. Turner², L.I. Biddle², R. Thompson²
¹University of Toledo, ²University of Arizona

Undergraduate Social Support and Career Networking as a Result of Membership in the University of Arizona Astronomy Club
Allison P.M. Towner¹, K. Hardegree-Ullman², A.P.M. Towner², A. Walker-LaFollette¹, A.M. McGraw¹, A. Robertson¹, C. Smith¹, L.I. Biddle¹, J. Turner¹
¹University of Arizona, ²University of Toledo

The University of Arizona Astronomy Club Outreaches out to the Public and Beyond
Allison M. McGraw¹, K. Hardegree-Ullman², A.P.M. Towner¹, A. Walker-LaFollette¹, A. Robertson¹, L.I. Biddle¹, J. Turner¹, C. Smith¹
¹The University of Arizona, ²The University of Toledo

Further Enhancement of the Astronomy Club at the University of Arizona
Lauren I. Biddle¹, A.P.M. Towner¹, A.M. McGraw¹, A. Walker-LaFollette¹
¹University of Arizona
105 WIYN Observatory - Building on the Past, Looking to the Future: Groundbreaking Science and Education

Monday, 10:00 AM - 11:30 AM, Wabash Ballroom 1, Indiana Convention Center

The WIYN Observatory partners are holding a “meeting-in-a-meeting” to highlight some key scientific contributions of the WIYN Observatory, familiarize the astronomical community with current WIYN instrumentation and capabilities, including the newest WIYN instrument, the One Degree Imager (ODI), and provide a forum for discussion of partnership arrangements for 4-meter class telescopes like WIYN. This first session will begin with an overview of the history, performance, and capabilities of the WIYN 3.5-m and 0.9-m telescopes. This will be followed by a series of talks describing representative science results obtained with the WIYN Observatory facilities and instruments. Perhaps in large part because it is open to the astronomical community via telescope time granted by NOAO, WIYN has produced high-impact results in a wide array of research areas, from stellar astrophysics to observational cosmology. Observers who would like to learn about what WIYN offers, who are considering using WIYN for their science, and/or who are initiating potential projects with ODI or any of the other WIYN instruments, are encouraged to attend the session to speak with WIYN staff and other experienced observers from the WIYN partnership.

Chair
Catherine A. Pilachowski¹
¹Indiana University

105.01 WIYN Observatory: Past, Present, and Future
Patricia Knezek¹
¹NOAO/WIYN Observatory

105.02 Probing the Dynamics of Open Star Clusters with WIYN/Hydra
Aaron M. Geller¹,²
¹Northwestern University, ²University of Wisconsin - Madison

Christian I. Johnson¹
¹University of California, Los Angeles

105.04 WIYN Studies of Environmental Effects on Virgo Cluster Galaxies
Jeffrey D. Kenney¹
¹Yale University

105.05 Stellar Populations in External Galaxies with WIYN
Katherine L. Rhode¹
¹Indiana Univ.

105.06 A Search for the Lowest Metallicity Galaxies at z=0.8
Isak Wold¹, A.J. Barger¹
¹University of Wisconsin - Madison

105.07 Mapping Dark Matter and the PSF: Weak Lensing Studies of Galaxy Clusters with pODI
Ian P. Dell’Antonio¹, J.E. McCleary¹
¹Brown Univ.
106 SPD Hale Prize Lecture: Twisting and Writhing with George Ellery Hale

Monday, 11:40 AM - 12:30 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
David Alexander
1Rice Univ.

The 2013 Hale Prize is awarded to Richard Canfield for his pioneering work on dynamics and radiation in solar flares and on the origins and implications of magnetic helicity in active regions, as well as for his role as a leader and mentor.

106.10 Twisting and Writhing with George Ellery Hale
Richard C. Canfield
1Montana State Univ.

107 NSF Town Hall

Monday, 12:45 PM - 1:45 PM, Wabash Ballroom 3, Indiana Convention Center

Staff from the National Science Foundation Division of Astronomical Sciences will inform the community about items of interest to them, including proposal opportunities, the federal budget request for Fiscal Year 2014, and the progress on responding to the AST Portfolio Review conducted in 2011-2012.

Chair
James S. Ulvestad
1National Science Foundation

Open Event: Interstellar Destinations

Monday, 1:30 PM - 2:00 PM

Recent statistical analyses of the Kepler exoplanet data (3700+ planets), when extrapolated to the Galaxy, indicate the that there may be more than 50 billion planets in the Milky Way. Moreover the these data suggest that about one in six stars (mostly red dwarf stars) could host earth-size planets some of which could be suitable for life. Particular attention will be given to stars within 20 light years of the Sun that are presently known to host potentially-habitable Earth-size planets. These nearby exoplanetary systems are discussed as possible future destinations for interstellar missions proposed by Icarus Interstellar, the 100-Year Starship and Star Voyager programs. A brief discussion of what it is takes to reach these stars and planets is given.

Organizer
Ed Guinan
1Villanova University

108 Astronomy Education: Where Are We Now and Where Are We Going?

Monday, 2:00 PM - 3:30 PM, Room 116, Indiana Convention Center

The learning and teaching of astronomy has changed over the past few decades in terms of content emphasis; approaches and effective teaching strategies; emphasis in k-12 classrooms; and placement and roles in teacher education. These changes are reflections of the research that has influenced and informed astronomy education. It is through astronomy education that our future leaders in the discipline will be motivated and where
public interest will be inspired. This session will provide some of the work that is currently being conducted in astronomy education within formal and informal learning environments as well as in teacher education programs. Presentations will include highly recognized leaders in astronomy, astronomy education and teacher education. The goal of this session is to consider what we should be teaching in astronomy, how we should be teaching it, whom we should be teaching and what areas of research should be pursued in astronomy education. Related Poster Sessions will provide opportunities for those immersed or interested in astronomy education to share and network with others, building on what we know and what we can do to improve astronomy in our schools and in our society.

Chair
Sharon Schleigh
1Purdue University

108.01 Undergraduate-Level Astronomy Education: Where We Are Now and Where We Could be Going in the Future?
Edward E. Prather
1Center for Astronomy Education (CAE), Univ. of Arizona

108.02 K-12 Teacher Professional Development
Mary Kay Hemenway
1Univ. of Texas-Austin.

108.03 Using AER to Improve Teacher Education
Randi R. Ludwig
1University of Texas

108.04 The Impact of the Next Generation Science Standards on Future Professional Development and Astronomy Education Research
Sanlyn Buxner
1, 2
1University of Arizona, 2Planetary Science Institute

108.05 Catalyzing Effective Science Education: Contributions from the NASA Science Education and Public Outreach Forums
Denise A. Smith1, L. Bartolone2, B. Eisenheimer3, B.L. Lawton1, G.R. Schultz3, L. Peticolas3, T. Schwerin1, S. Shipp6, NASA Astrophysics E/PO Community, NASA Astrophysics Forum Team
1STScI, 2Adler Planetarium, 3Astronomical Society of the Pacific, 4UC-Berkeley, 5Institute for Global Environmental Strategies, 6Lunar and Planetary Institute

109 Bridging Laboratory and Astrophysics: Molecules
Monday, 2:00 PM - 3:30 PM, Room 117, Indiana Convention Center
Laboratory astrophysics is the Rosetta Stone that enables astronomers to understand and interpret the cosmos. This session will focus on the interplay between astrophysics with theoretical and experimental studies into the underlying molecular processes which drive our Universe.

Chair
Steven R. Federman
1Univ. of Toledo

109.01 Complex Organic Molecules in Protoplanetary Disks
Catherine Walsh1, 2, T.J. Millar3, H. Nomura3, E. Herbst4, 5, S. Widicus-Weaver6
1Leiden University, Netherlands, 2Queen’s University Belfast, United Kingdom, 3Kyoto University, Japan, 4University of Virginia, 5Ohio State University, 6Emory University
109.02 Microwave to Submillimeter Observations of Molecules in the Laboratory and in Space
DeWayne Halfen
University of Arizona

109.03 Investigations of the Formation of Carbon Grains in Circumstellar Outflows
Cesar Contreras1, F. Salama1
1NASA Ames Research Center, Oak Ridge Associated Universities; 2Bay Area Environmental Research Institute

109.04 From Isolated Molecules to Clusters and Aggregates – Spectroscopic Properties dictate Photochemical Behavior: Applications to Astrophysics and Planetary Sciences
M. Gudipati1, I. Couturier-Tamburelli2, R. Jacovi1, A. Lignell1
1Jet Propulsion Laboratory; 2PIIM, UMR CNRS 7345, Aix-Marseille Universite; 3Flight Control Group, Urban Aeronautics LTD, Nahal-Snir 10, Yavne 81224, ISRAEL; 4Caltech; 5IPST, University of Maryland

110 Interstellar Medium, Dust, Etc
Monday, 2:00 PM - 3:30 PM, Wabash Balloom 3, Indiana Convention Center

Chair
Steven R. Spangler
Univ. of Iowa

110.01 The Effect of Composition on the Spectral Features of Silicate Glasses: The Effect of Aluminium
Angela Speck1, A.G. Whittington1, A.M. Hofmeister2
1Univ. of Missouri; 2Washington University

110.02D Large Scale Two-Fluid Simulations of Molecular Clouds with Statistical Tracers of Magnetized Turbulence
Chad Meyer1, D.S. Balsara1
University of Notre Dame

110.03 Interacting Galactic Neutral Hydrogen Filaments and Associated High-Frequency Continuum Emission
Gerrit L. Verschuur1
University of Memphis

110.04D 2010 BLASTPol Observations of the Magnetic Field of the filamentary Galactic Cloud 'Lupus I'
1Northwestern University; 2Cardiff Univ., United Kingdom; 3Univ. of Pennsylvania; 4Univ. of Toronto, Canada; 5Nagoya Univ., Japan; 6Univ. of Miami, 7Brown Univ., 8California Institute of Technology, 9Univ. of Puerto Rico, 10NAF, Osservatorio Astrofisico di Arcetri, Italy; 11Univ. College London, United Kingdom; 12Univ. of British Columbia, Canada; 13University of Central Lancashire, United Kingdom

110.05 Finding the True Metal Abundances in High Velocity Clouds
Jeffrey Gritton1, R.L. Shelton1, K. Kwak2
1University of Georgia; 2Ulsan National Institute of Science and Technology, Republic of Korea

110.06 Gas, Dust and Star Formation in Nearby Galaxies: The JCMT Perspective
Jose R. Sanchez-Gallego1
University of Kentucky
111 WIYN Observatory - Building on the Past, Looking to the Future: pODI and Instrumentation

Monday, 2:00 PM - 3:30 PM, Wabash Ballroom 1, Indiana Convention Center

The WIYN Observatory partners are holding a “meeting-in-a-meeting” to highlight some key scientific contributions of the WIYN Observatory, familiarize the astronomical community with current WIYN instrumentation and capabilities, including the newest WIYN instrument, the One Degree Imager (ODI), and provide a forum for discussion of partnership arrangements for 4-meter class telescopes like WIYN. This second session will focus on the characteristics and performance of ODI and other WIYN instrumentation. The first configuration of ODI, called pODI (partial ODI), consists of a central 24 arcmin by 24 arcmin array plus an additional four 8 arcmin by 8 arcmin arrays located at various radial distances to sample the full one degree field. ODI was designed to exploit WIYN’s superior image quality; initial testing indicates that ODI can achieve FWHM PSF values of 0.3-0.5 arcsec, even with static imaging. ODI’s detectors also provide excellent blue sensitivity, with DQE in the U-band of ~80 percent. WIYN staff will describe ODI’s performance metrics and capability and show initial science results obtained during the commissioning and shared-risk observing phases. The ODI Pipeline, Portal, and Archive (ODI-PPA) project, which will provide data reduction, some analysis tools, and archiving for ODI, will be introduced. The session will also feature information about and results from WIYN’s other instruments: the Hydra multi-object spectrograph, the WIYN High-Resolution Infrared Camera (WHIRC), and integral field spectroscopy instruments on the 3.5meter and optical imagers on the 0.9meter, including a new monolithic half-degree imager. Observers who are considering using WIYN for their science, and/or initiating potential projects using pODI or any of the other WIYN instruments, are encouraged to attend the session to speak with WIYN staff and other experienced observers from the WIYN partnership.

Chair
Katherine L. Rhode
Indiana Univ.

111.01 The WIYN One Degree Imager - Status and Performance
Todd A. Boroson
NOAO

111.02 The WIYN One Degree Imager: First Operations and Future Upgrade Path
Daniel R. Harbeck, ODI Team, PPA Team
WIYN Observatory

111.03 The Pipeline, Portal and Archive (PPA) System for the WIYN Partial One Degree Imager
Jayadev Rajagopal, ODI, PTI, NOAO-SDM
NOAO

111.04 The Hydra Multi-Object Spectrograph
Patricia Knezek
NOAO/WIYN Observatory

111.05 Integral Field Spectroscopy on the 3.5-m WIYN Telescope
Marsha J. Wolf
Univ. of Wisconsin - Madison

111.06 The WIYN 0.9-meter Consortium and the Half Degree Imager
Constantine P. Deliyannis
Indiana Univ.

111.07 The WHIRC near-IR Camera
Jayadev Rajagopal
CTIO
112 The Secret Life of Globular Clusters
Monday, 3:40 PM - 4:30 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
Paula Szkody¹
¹University of Washington

112.01 The Secret Life of Globular Clusters
Catherine A. Pilachowski¹
¹Indiana University

113 Supernovae and Their Diversity
Monday, 4:30 PM - 5:20 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
Paula Szkody¹
¹University of Washington

113.01 Supernovae and Their Diversity
Peter M. Garnavich¹
¹Univ. of Notre Dame

LGBTIQ Networking Dinner
Monday, 6:30 PM - 8:30 PM, Registration Desk, Indiana Convention Center

The AAS Working Group on LGBTIQ Equality (WGLE) works to promote equality for lesbian, gay, bisexual, transgender, intersex, and questioning individuals within our profession. Join us for dinner on Monday evening, June 3. We’ll meet in front of the AAS Meeting Registration Desk at 6:30 and walk to a local restaurant. Please bring a method of payment for this dinner.

Organizer
Van Dixon¹
¹Space Telescope Science Institute
Monday Posters

114 Laboratory Astrophysics

Monday - Thursday, Exhibit Hall D, Indiana Convention Center

114.01 Uncertainties in Atomic Data and Their Propagation Through Spectral Models
Manuel Bautista, V. Fivet, P. Quinet, C. Mendoza, T.R. Kallman
1Western Michigan University, 2NASA/GSFC, 3Mons University, Belgium

114.02 AtomPy: A Cloud Atomic-data Service for Astrophysical Applications
Claudio Mendoza, J.S. Boswell, M. Bautista
1Western Michigan University

114.03 Modeling Laser-Driven Laboratory Astrophysics Experiments Using the CRASH Code
1University of Michigan, 2Nuclear Research Center, Israel

114.04 An Experimental Concept to Measure Opacities Under Solar-relevant Conditions
Paul Keiter, K. Mussack, S. Klein
1University of Michigan, 2Los Alamos National Laboratory

114.05 Single-Mode, Supersonnic Kelvin-Helmholtz Instability Experiment on OMEGA-EP
Wesley Wan, G. Malamud, C. Di Stefano, C.C. Kuranz, R. Drake
1University of Michigan

114.06 Storage Ring Measurements of Electron Impact Ionization for Astrophysics
1Columbia University, 2Max-Planck-Institut für Kernphysik, Germany, 3Justus-Liebig-Universität, Germany, 4GSI Helmholtzzentrum für Schwerionenforschung, Germany

114.07 Dissociative Recombination of Molecular Ions for Astrochemistry
1Columbia University, 2Max-Planck-Institut für Kernphysik, Germany, 3Weizmann Institute of Science, Israel, 4Stockholm University, Sweden, 5Justus-Liebig-Universität, Germany, 6Chinese Academy of Sciences, China, 7University of the Chinese Academy of Sciences, China

114.08 Laboratory Investigations Into The Origins Of Organic Chemistry
1Columbia University, 2Universite catholique de Louvain, Belgium

114.09 Oscillator Strengths and Predissociation Rates for Rydberg Transitions between 92.7 and 97.5 nm in 13C16O and 12C18O
1Univ. of Toledo, 2Obs. de Paris, France, 3Wellesley, 4Univ. Paris VI, France, 5UCLA, 6Synchrotron SOLEIL, France

114.10 Abundances of Neutral and Ionized PAH Along The Lines-of-Sight of Diffuse and Translucent Interstellar Clouds
Farid Salama, G. Galazutdinov, J. Krekowski, L. Biennier, Y. Beletsky, I. Song
1NASA Ames Research Center, 2Universidad Catolica del Norte, Chile, 3Nicolaus Copernicus University, Poland, 4Institut de Physique de Rennes, France, 5European Southern Observatory, Chile, 6Korea Science Academy, Republic of Korea
114.11 The ORGANIC Experiment on EXPOSE-R on the ISS: A Space Exposure Experiment
Kathryn Bryson1,3, Z. Peeters4, F. Salama5, B. Foing6, P. Ehrenfreund3,6, A. Ricco7, E.K. Jessberger8, A. Bischoff9, M. Breitfellner9, W. Schmidt10, F. Robert11
1BAERI, 2Carnegie Institute of Washington, 3NASA ARC, 4ESA, ESTEC, Netherlands, 5Leiden Institute of Chemistry, Netherlands, 6Space Policy Institute, 7NASA ARC, 8Westfälische Wilhelms-Universität Münster, Germany, 9ESAC, ESA, Spain, 10PAH Research Institute, Germany, 11Muséum National d’Histoire Naturelle, France

114.12 A Need for Modeling N-rich, C-, O-poor Chemistry
Theodore R. Gull1
1NASA/GSFC

114.14 Ion Heating During Magnetic Reconnection in a High Temperature Toroidal Plasma
Darren Craig1, M. Cartolano1, D.J. Den Hartog1, S.T. Kumar2, R. Magee2, M.D. Nornberg2
1Wheaton College, 2University of Wisconsin

114.15 Investigation of Plume Dynamics in Pulsed Infrared Laser Ablation of Interstellar and Solar System Ice Analogs
Bryana L. Henderson1,2, M. Gudipati1
1Jet Propulsion Lab, 2NASA Postdoctoral Program

114.16 X-Ray powder diffraction of cosmic dust analogues
Sarah Day1, S.P. Thompson2, A. Evans1, J.E. Parker2
1Keele University, United Kingdom, 2Diamond Light Source, United Kingdom

114.17 Atomic and Molecular Wavelength Calibration Sources for Astronomy
Stephen L. Redman1, G. Nave1, C.J. Sansonetti1, J. Smoker2, F. Kerber1
1National Institute of Standards and Technology, 2European Southern Observatory, Chile, 3European Southern Observatory, Germany

114.18 Laboratory Molecular Ion Spectroscopy in an Ion Beam
Michael Porambo1, J. Pearson1, C. Riccardo1, B.J. McCall1
1University of Illinois

115 Binaries, Variable Stars and White Dwarfs
Monday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center

115.01 Pulsational Light Variability in a Sample of Carbon-rich Post-AGB Stars in the Magellanic Clouds
Bruce J. Hrivnak1, W. Lu1, I. Soszynski2, R. Szczerba3, K. Volk4
1Valparaiso Univ., 2Warsaw University Observatory, Poland, 3N. Copernicus Astronomical Center, Poland, 4Space Telescope Science Center

115.02 A Study of Light Variability in a Sample of Proto-planetary Nebula Candidates
Aaron M. Seider1, H.M. Rotter1, A.L. Bain1, B.J. Hrivnak1, W. Lu1
1Valparaiso University

115.03 Disk Properties in Taurus Binary Systems
Rachel L. Akeson1, E.L.N. Jensen2
1NASA Exoplanet Science Institute, 2Swarthmore College

115.04 Fundamental Properties of the LMC Eclipsing Binary Macho* J053648.7-691700
Frank P. Maloney1, E. Bachmakov1, G. Matijevic1, E.F. Guinan1, E.L. Fitzpatrick1, A. Prsa1
1Villanova University
115.05 Photometric Observations of the Totally Eclipsing, Solar Type Eclipsing Binary, DK Andromedae
Ronald G. Samec1, D.R. Faulkner3, W.V. Van Hamme3, J. Kring3
1Bob Jones Univ., 2University of South Carolina, 3Florida International University

115.06 Photometric Study of the Solar Type Pre-Contact Binary, V2421 Cygni
Robert L. Hill1, T. Shebs1, R.G. Samec1, J. Kring1, W.V. Van Hamme2, D.R. Faulkner3
1Bob Jones University, 2Florida International University, 3University of South Carolina

115.07 A Spectroscopic Investigation of the Interaction of Delta Scorpius with its Companion
Mary McDaniel1, M. Blake1, T.C. Garber1, M.W. Castelaz2
1University of North Alabama, 2Pisgah Astronomical Research Institute

115.08 Investigation of the Orbital Properties of Intermediate-Mass Eclipsing Binary Star Systems
Sierra Obryan1, W.T. Ryle1, S. Williams2
1Thomas More College, 2Georgia State University

115.09 A New Eclipsing Binary Discovered in a Crowded Star Field
Jessica A. Larson1, E. Ranquist1, A. Hernandez1, E. Stoker1, C. Gaillard1
1Brigham Young University

115.10 A Calibrated H-alpha Index to Monitor Emission Line Objects
Eric G. Hintz1, M.D. Joner1
1Brigham Young Univ.

115.11 Those Crafty Cepheids: Surprises From Ground-Based Photometry and HST-COS FUV Spectra
Scott G. Engle1, E.F. Guinan1, H. Neilson2, R.P. Wasatonic1, G. Harper3
1Villanova Univ., 2East Tennessee State University, 3Trinity College Dublin, Ireland

116 Stars, Stellar Evolution and Atmospheres, Circumstellar Disks
Monday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center

116.01 Photometric Parallaxes and Subdwarf Identification for M Stars
Dayna L. Thompson1, T.H. Robertson1, S.K. Thompson1
1Ball State University

116.02 Identifying Subluminous M Stars Using Three Color Photometry
Thomas H. Robertson1, S.K. Thompson3, D.L. Thompson1
1Ball State Univ.

116.03 Multithermal Analysis of Coronal Loops Using SDO-AIA Data
Joan T. Schmelz1, S. Pathak1
1Univ. of Memphis
MONDAY POSTER SESSIONS

POSTERS: MON

116.04 The Young Solar Analogs Project: Initial Photometric Results
Jon M. Saken1, R.O. Gray2, C.J. Corbally3
1Marshall University, 2Appalachian State University, 3Vatican Observatory

116.05 Upcoming Microlensing by Proxima Centauri: A Rare Opportunity for Mass Determination and Planet Detection
Kailash C. Sahu1, H.E. Bond1, J. Anderson1, M. Dominik2
1STScI, 2University of St. Andrews, United Kingdom

116.06 White Light Flares and Spots on an L1 Dwarf
John Gizis1, A.J. Burgasser2, E. Berger3, P.K.G. Williams3, F.J. Vrba4, K.L. Cruz5,6, S.A. Metchev7
1Univ. Of Delaware, 2University of California, San Diego, 3Harvard-Smithsonian Center for Astrophysics, 4US Naval Observatory, 5Hunter College, 6American Museum of Natural History, 7State University of New York, Stony Brook

116.07 Stellar Rotation and the Chronology of the Galaxy
Donald M. Terndrup1
1Ohio State Univ.

116.08 Luminous and Variable Stars in M31 and M33. I. The Warm Hypergiants and Post-Red Supergiant Evolution
Robert M. Humphreys1, K. Davidson1, S. Grammer1, J.C. Martin1, K. Weis2
1Univ. of Minnesota, 2Astronomical Institute, Ruhr-Universitaet Bochum, Germany

116.09 High Resolution Spectroscopy of Two Anomalous Groups in M67
Courtney McGahee1, J.R. King1, C.P. Deliyannis2, R.M. Maderak2
1Clemson University, 2Indiana University

116.10 The Abundance of Fluorine in Open Cluster Giants
Kristie A. Nault1, C.A. Pilachowski1
1Indiana University

116.11 The Massive Star Population in M101
Skyler Grammer1, R.M. Humphreys1
1University of Minnesota

116.12 Hubble Space Telescope IR Surface Brightness Fluctuation Color Measurements in the Virgo and Fornax Clusters
Joseph B. Jensen1, N.E. Boyer1, J.P. Blakeslee2, H. Lee3
1Utah Valley University, 2Herzberg Institute of Astrophysics, Canada, 3University of Texas-Pan American

116.13 Variability in Optical Spectra of ε Orionis
Gregory B. Thompson1, N.D. Morrison2
1Adrian College, 2University of Toledo

116.14 Signatures of Rotational Modulation of Magnetic “Active Regions” in Hybrid and Non-coronal Cool Giant Stars
Kenneth G. Carpenter1, V. Airapetian2
1NASA’s GSFC, 2Sigma Space Corporation

Michael L. Sitko1,2, R.W. Russell3, L. Bernstein4, A.N. Day1,5, A.N. Johnson1, J.R. Swearingen1, C. Grady6, C.M. Lisse7, M. Cure8, S. Kraus11, M. Fukagawa9, N. Calvet11, C. Espaillat11, J.D. Monnier12, R. Millan-Gabet10, D.J. Wilner11
1Univ. of Cincinnati, 2Space Science Institute, 3The Aerospace Corporation, 4Spectral Sciences, Inc., 5Miami University, 6Eureka Scientific, Inc., 7JHU-APL, 8Universidad de Valparaiso, Chile, 9Osaka University, Japan, 10California Institute of Technology, 11Harvard-Smithsonian Center for Astrophysics, 12University of Michigan
116.16 Variable Circumstellar Disks of “Classical” Be Stars
Cody Gerhardt\textsuperscript{1}, K.S. Bjorkman\textsuperscript{1}, J.P. Wisniewski\textsuperscript{2}
\textsuperscript{1}University of Toledo, \textsuperscript{2}University of Oklahoma

116.17 Ultracool Dwarf Spectroscopic Templates, Bolometric Fluxes, and X Factors
Sarah J. Schmidt\textsuperscript{1}, A.A. West\textsuperscript{1}, J.J. Bochanski\textsuperscript{3}, S.L. Hawley\textsuperscript{4}
\textsuperscript{1}Ohio State University, \textsuperscript{2}Boston University, \textsuperscript{3}Haverford College, \textsuperscript{4}University of Washington

117 Young Stellar Objects, Star Formation, and Star Clusters
Monday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center

117.01 Fundamental Parameters of Nearby Young Stars
Kyle McCarthy\textsuperscript{1}, R.J. Wilhelm\textsuperscript{1}
\textsuperscript{1}University of Kentucky

117.02 Early Evolution of Rotating Star Clusters - Homogeneous Initial Conditions
Maria A. Tiongco\textsuperscript{1}, A. Varri\textsuperscript{1}, E. Vesperini\textsuperscript{1}, S.L.W. McMillan\textsuperscript{2}, C. Gosmeyer\textsuperscript{1}
\textsuperscript{1}Indiana University, \textsuperscript{2}Drexel University

117.03 Early Evolution of Rotating Star Clusters - Inhomogeneous Initial Conditions
Catherine Gosmeyer\textsuperscript{1}, A. Varri\textsuperscript{1}, E. Vesperini\textsuperscript{1}, S.L.W. McMillan\textsuperscript{2}, M.A. Tiongco\textsuperscript{1}
\textsuperscript{1}Indiana University, \textsuperscript{2}Drexel University

117.04 The Mass of the Most Massive Star in Stellar Clusters Determined from 25 Million MASSCLEAN Monte Carlo Simulations
Bogdan Popescu\textsuperscript{1}, M.M. Hanson\textsuperscript{1}, J. Borissova\textsuperscript{2}, R. Kurtev\textsuperscript{2}, V. Ivanov\textsuperscript{2}, S.S. Larsen\textsuperscript{4}, M. Catelan\textsuperscript{2}, D. Minniti\textsuperscript{3}, P. Lucas\textsuperscript{5}
\textsuperscript{1}Univ of Cincinnati, \textsuperscript{2}Universidad de Valparaiso, Chile, \textsuperscript{3}ESO, Chile, \textsuperscript{4}Radboud Universiteit Nijmegen, Netherlands, \textsuperscript{5}Pontificia Universidad Catolica, Chile

117.05 A Search for Variable Stars in Open Clusters: NGC 7654 and More
Adam Pierce\textsuperscript{1}, E.G. Hintz\textsuperscript{1}
\textsuperscript{1}Brigham Young Univ.

117.06 Kinematics and Colors of Star Clusters in M101
Lesley A. Simanton\textsuperscript{1}, R. Chandar\textsuperscript{1}, B. Miller\textsuperscript{2}
\textsuperscript{1}University of Toledo, \textsuperscript{2}Gemini Observatory, Chile

117.07 H-alpha/H-beta Index Measurements for Stars in Open Clusters
Andrew Hernandez\textsuperscript{1}, E.G. Hintz\textsuperscript{1}, M.D. Joner\textsuperscript{1}
\textsuperscript{1}Brigham Young Univ.

117.08 Identification of Faint Chandra X-ray Sources in the Core-Collapsed Globular Cluster NGC 6752
Phyllis M. Lugger\textsuperscript{1}, H.N. Cohn\textsuperscript{1}, A. Cool\textsuperscript{2}, C.O. Heinke\textsuperscript{3}, J. Anderson\textsuperscript{4}
\textsuperscript{1}Indiana Univ., \textsuperscript{2}San Francisco State Univ., \textsuperscript{3}Univ. of Alberta, Canada, \textsuperscript{4}Space Telescope Science Inst.

117.09 Spatial Mixing of Multiple Stellar Populations in Globular Clusters
Enrico Vesperini\textsuperscript{5}, S.L.W. McMillan\textsuperscript{2}, F. D’Antona\textsuperscript{4}, A. D’Ercole\textsuperscript{4}
\textsuperscript{1}Indiana University, \textsuperscript{2}Drexel University, \textsuperscript{3}Rome Observatory, Italy, \textsuperscript{4}Bologna Observatory, Italy

118 Supernovae and Supernova Remnants
Monday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center

118.01 Cosmology Biases in the Analysis of Future Supernova Surveys
Lynn Stanwyck\textsuperscript{1,3}, S. Kuhlmann\textsuperscript{1}, E. Gjergo\textsuperscript{1,2}, R. Biswas\textsuperscript{1}, E. Kovacs\textsuperscript{1}
\textsuperscript{1}Argonne National Laboratory, \textsuperscript{2}Illinois Institute of Technology, \textsuperscript{3}Lemont Township High School
118.02 Comparison of Supernovae Data Sets with Modified Gravity and Dark Energy Models
Eda Gjergo1, 2, S. Kuhlmann1, Y. Shylnov2
1Argonne National Laboratory, 2Illinois Institute of Technology

118.03 Spectroscopy of Sloan Digital Sky Survey II Supernovae Host Galaxies
Matt Olmstead1, K.S. Dawson1, P. Brown1, M. Sako2, L. Galbany1, 4, J. Marriner1, R. Nichol6
1University of Utah, 2University of Pennsylvania, 3Institut de Fisica d’Altes Energies, Universitat Autonoma de Barcelona, Spain, 4Centro Multidisciplinar de Astrofisica, Instituto Superior Tecnico, Portugal, 5Center for Astrophysics, Fermi National Accelerator Laboratory, 6Institute of Cosmology and Gravitation, University of Portsmouth, United Kingdom, 7George P. and Cynthia Woods Mitchell Institute for Fundamental Physics & Astronomy, Texas A. & M. University

118.04 The Detection of a Light Echo from Type Ia SN 2007af in NGC 5584
Dina Drozdov1, M.D. Leising1, P. Milne2, A.G. Riess3
1Clemson University, 2University of Arizona, 3Johns Hopkins University

118.05 Late-2012 Photometry of SN 2009ip
John C. Martin1, F. Hambsch2, T.G. Tan3, I.A. Curtis4
1U of Illinois Springfield, 2Remote Observatory Atacama Desert, Chile, 3Sarawak Skies, Australia, 4Australia

118.06 The Mid-Infrared and Optical Decay of SN 2011fe
Colin McClelland1, P.M. Garnavich1, P. Milne2, B. Shappee3, R.W. Pogge1
1University of Notre Dame, 2University of Arizona, 3The Ohio State University

118.07 Polarization and the Evolution of Expansion Velocity in Type Ia Supernovae
Amber L. Porter1, M.D. Leising1
1Clemson University

118.08 The Fundamental Metallicity Relation Reduces Type Ia Supernova Hubble Residuals More Than Host Mass Alone
Brian Hayden1, R. Gupta2, P.M. Garnavich1, F. Mannucci2, R. Nichol4, M. Sako2
1University of Notre Dame, 2University of Pennsylvania, 3Istituto Nazionale di Astrofisica, Osservatorio Astrofisico di Arcetri, Italy, 4Institute of Cosmology and Gravitation, Portsmouth University, United Kingdom

118.09 3-D Rendering of the Supernova Remnant 1E0102.2-7219 in the SMC
Jake Lyle1, C. Garges1, J.A. Morse1
1Rensselaer Polytechnic Institute

118.10 On the Hard X-ray Emission Detected from the Northwestern Rim of the Galactic Supernova Remnant G156.2+5.7
Thomas Pannuti1, G.E. Allen2, W.P. Moffitt1, C. Grimes3, 1, A. Lackey-Stewart1, A. Hughes1, K.H. Young1
1Morehead State University, 2MIT, 3University of New Mexico

118.11 UV and Optical Spectroscopy of SNR E0102 in the SMC
Cody Garges1, J.A. Morse1, K. France2, J.C. Green2
1Rensselaer Polytechnic Inst, 2University of Colorado Boulder

119 Cosmology and Associated Topics
Monday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center

119.01 Precision Cosmology with a New Probabilistic Photometric Redshifts Approach
Matias Carrasco Kind1, R.J. Brunner1
1University of Illinois at Urbana Champaign
119.02 Diagnostic Tests for Systematic Effects on Large Scale Structure
Yiran Wang1, R.J. Brunner1
1University of Illinois at Urbana-Champaign

119.03 The Evolution of the Distribution of Enriched Material in Large Scale Structure from z=3 to z=0
Ali Snedden1, L.A. Phillips1, G.J. Mathews1, J. Coughlin1, A. Bhattacharya1, I. Suh1
1University of Notre Dame

119.04 The Metallicity Distribution of the Circumgalactic Medium Traced by Optically-Thick Lyman Limit Systems
Christopher Wotta1, J.C. Howk1, N. Lehner1, J. O'Meara2
1University of Notre Dame, 2Saint Michael's College

119.05 Coasting Universe From z=50 till Now
David F. Bartlett1, J.P. Cumalat1
1University of Colorado

119.06 Early Results from the First Year of Observations by the Atacama B-mode Search (ABS)
Sara M. Simon1, ABS Collaboration
1Princeton University

119.07 The E and B EXperiment EBEX
1Brown University, 2University of Minnesota, 3Cardiff University, United Kingdom, 4McGill University, Canada, 5Scuola Internazionale Superiore di Studi Avanzati, Italy, 6Lawrence Berkeley National Laboratory, 7Columbia University, 8Institut d’Astrophysique Spatiale, Université Paris-Sud, France, 9National Institute of Standards and Technology, 10Imperial College, United Kingdom, 11University of California Berkeley, 12Weizmann Institute of Science, Israel, 13CNRS, Laboratoire Astroparticule et Cosmologie (APC), Université Paris Diderot, France, 14Laboratoire de l’Accélérateur Linéaire, Université Paris Sud, CNRS, France, 15Institute for Advanced Study

119.08 A Search for Dark Matter Annihilation from Dwarf Galaxies using VERITAS
Ben Zitzer1, VERITAS Collaboration
1Argonne National Laboratory

119.09 Deep Images of a 2 deg Large Quasar Group Field
Eric C. Feil1, G.M. Williger1, D. Valls-Gabaud2, R. Clowes3, L. Campusano4, L. Haberzetti5, N. Nesvadba6, M. Lehner7, R. Dave8, C.P. Haines8
1University of Louisville, 2Obs. de Paris, France, 3U Central Lancashire, United Kingdom, 4U. de Chile, Chile, 5U. de Paris-Sud, France, 6Inst d’Astrophysique, France, 7U. Western Cape, South Africa, 8U. Arizona

120 Astronomy Education & Public Outreach
Monday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center

120.01 EduBites: Cliffs Notes for EPO
Carolyn Brinkworth1, L. Bartolone2, M. Wenger3, A. Martin4, M. Nichols-Yehling5, J. Llamas1, R.L. Hurt1, G.K. Squires1
1IPAC/Caltech, 2Adler Planetarium, 3University of Arizona, 4NASA Langley Research Center
120.02 An Update on the AAS Astronomy Ambassadors Program  
1American Astronomical Society, 2Astronomical Society of the Pacific, 3Foothill College,  
4CAE/University of Arizona, 5Pacific Science Center

120.03 Partnerships: The Key to Sustainability and Reach for E/PO  
Bonnie Eisenhamer1, D. McCallister1, H. Ryer1  
1STScI

120.04 Out in Space: A True Musical Collaboration Between an Astronomer and a Music Producer  
James R. Webb1, K. Morrison2  
1Florida International Univ., 2Kokopelli Studios

120.05 Youth for Astronomy and Engineering - Engaging Local Families and Partners  
Tania Anderson1, B. Eisenhamer1, H. Ryer1  
1Space Telescope Science Institute

120.06 New Observatory Outreach Programs for Students in Grades 3-12  
Bhasker K. Moorthy1, J. Kabbes1, K.A. Page1, K. Cole1  
1William Rainey Harper College

120.07 Celebrating Ten Years of Progress at The Bank of Kentucky Observatory of Thomas More College  
Wes T. Ryle1  
1Thomas More College

120.08 Evaluating Middle School Students’ Spatial-scientific Performance in Earth-space Science  
Jennifer Wilhelm1, C. Jackson1, M.D. Toland1, M. Cole1, R.J. Wilhelm1  
1University of Kentucky

120.09 Exploring the Relationships Between Student Moon Observations and Spatial-Science Reasoning  
Merryn Cole1, J. Wilhelm1, C. Jackson1, H. Yang1, R.J. Wilhelm1  
1University of Kentucky

120.10 CosmoQuest Year 1.5: Citizen Scientist Behaviors and Site Usage Across Multiple Projects  
Nicole E. Gugliucci1, P.L. Gay1, G. Bracey1, CosmoQuest Team1  
1SIUE

120.11 SkyGlowNet as a Vehicle for STEM Education  
K. M. Flurchick1, E.R. Craine1, 4, R.B. Culver2, 4, S. Deal1, C. Foster1  
1NCAandT, 2CSU, 3WRC, 4STEM Lab

120.12 What Non-science Majors Gain from Participating in Authentic Scientific Research: The Results from a Decade-long Assessment Program  
Michelle Wooten1, T.A. Rector1, A.W. Puckett1, K.A. Coble2  
1University of Alaska Anchorage, 2Chicago State University

120.13 Mars: A Freshmen Year Seminar of Science and Science-fiction  
Michael Svec1, D.A. Moffett1, M. Winiski1  
1Furman University

120.14 An Experiment with Open-Source Introduction to Astronomy  
Geoffrey S. Burks1  
1Tennessee State Univ.

120.15 TeachAstronomy.com - Digitizing Astronomy Resources  
Kevin Hardegree-Ullman1, 2, C.D. Impey2, C. Austin2, A. Patikka2, M. Paul2, N. Ganesan2  
1University of Toledo, 2University of Arizona
First Steps Toward Exploring NITARP’s Impacts on Teachers’ Knowledge, Attitudes, and Teaching
Debbie French¹, T.F. Slater¹, A.C. Burrows¹
¹University of Wyoming and CAPER Center for Astronomy & Physics Education Research,
²New Philadelphia City Schools

Where Students Get Their Information about Science and Technology and Assessment of That Knowledge
Sanlyn Buxner¹, J. Llull¹, C.D. Impey¹, K. Tijerino¹, Collaboration of Astronomy Teaching Scholars (CATS)
¹University of Arizona
200 SPD Harvey Prize Lecture: Modeling Solar Eruptions: Where Do We Stand?

Tuesday, 8:30 AM - 9:20 AM, Wabash Ballroom 1, Indiana Convention Center

Chair
David Alexander

The 2013 Harvey Prize is awarded to Tibor Torok for his innovative numerical studies and theoretical analyses of the role of magnetohydrodynamical instabilities in the initiation and driving of coronal mass ejections.

200.01 Modeling Solar Eruptions: Where Do We Stand?
Tibor Torok

Open Event: A Glimpse of Galaxies at the Dawn of the Universe

Tuesday, 9:30 AM - 10:00 AM

The Ultra Deep Field imaged by the Hubble Space Telescope provides the most distant glimpse of galaxies ever taken, probing them less than 2 billion years after the Big Bang. Galaxies in the early universe have unusual clumpy appearances from giant star-forming regions 100 times more massive than those forming in galaxies like the Milky Way. Comparisons of high redshift galaxies with rare nearby clumpy galaxies provide clues about how the distant young systems have evolved into today’s spiral galaxies.

Organizer
Debra Elmegreen

201 Astronomy Education & Public Outreach

Tuesday, 10:00 AM - 11:30 AM, Room 116, Indiana Convention Center

Chair
Robert Mathieu

201.01 My Sky Tonight: Nurturing a Scientific Frame of Mind in Early Childhood
Jim Manning, J. Manning, G.R. Schultz, S. Gurton, J. Plummer, M. Callanan, J. Jipson, S. Palmquist

201.02 Inclusive Design for Learning - Making Your Classroom Accessible
Angela Speck, G. Ceylan

201.03 Continued Testing of Head-Mounted Displays for Deaf Education in a Planetarium
Eric G. Hintz, M. Jones, J. Lawler, N. Bench, F.R. Mangrubang

1Astronomical Society of the Pacific, 2Penn State University, 3UC Santa Cruz, 4Cal Poly San Luis Obispo, 5Palmquist & Associates
Tuesday Sessions and Events

201.04 Using Attendance Worksheets to Improve Student Attendance, Participation, and Learning
Edward Rhoads¹
¹IUPUI

201.05 Two Eyes, 3D Early Results: Stereoscopic vs 2D Representations of Highly Spatial Scientific Imagery
Aaron Price¹,²
¹Museum of Science and Industry, Chicago, ²AAVSO

201.06 Operationalizing the 21st Century Learning Skills Framework for the NASA Mission to Mars Program
Burgess Smith¹, MSI Research & Evaluation Team, MSI Interactive Videoconferences Team
¹Museum of Science and Industry Chicago

201.07 Peer-to-Peer Instruction with Interactive Demonstrations in Upper Level Astronomy Courses
Richard Gelderman¹
¹Western Kentucky Univ.

201.08 Astrobites: The Online Astronomy Research Digest for Undergraduates
Christopher Faesi¹, Astrobites Collaboration
¹Harvard Univ.

202 Bridging Laboratory and Astrophysics: Dust and Ices
Tuesday, 10:00 AM - 11:30 AM, Room 117, Indiana Convention Center
Laboratory astrophysics is the Rosetta Stone that enables astronomers to understand and interpret the cosmos. This session will focus on the interplay between astrophysics with theoretical and experimental studies into the underlying dust and ice processes which drive our Universe.

Chair
Farid Salama¹
¹NASA Ames Research Center

202.01 The Importance of Dust for Astrophysics
Stephen Rinehart¹
¹NASA's GSFC

202.02 Interstellar Ice Chemistry: From Water to Complex Organics
Karin I. Oberg¹, E. Fayolle², H. Linnartz², E. van Dishoeck², J. Fillion³, M. Bertin³
¹University of Virginia, ²Leiden University, Netherlands, ³UPMC univ Paris 6, LPMAA, France

202.03 New Laboratory-Based Optical Functions of Cosmic Abundance Glass: Comparison to “Astronomical Silicates” and Application to Post-AGB Object HD 161796
Angela Speck¹,⁴, K.M. Pitman², A.M. Hofmeister², A.G. Whittington⁴
¹University of Missouri, ²Planetary Science Institute, ³Washington University, ⁴University of Missouri

202.04 Experimental Investigation of Charging Properties of Interstellar Type Silica Dust Grains by Secondary Electron Emissions
Dragana Tankosic¹, M.M. Abbas²
¹NASA/MSFC, ²NASA/MSFC
203 Outer Limits of the Milky Way I: Overview and Theories of Galactic Structure

Tuesday, 10:00 AM - 11:30 AM, Wabash Ballroom 3, Indiana Convention Center

High angular and velocity resolution surveys of the Milky Way Galaxy, which have revolutionized our understanding of the inner parts of the Milky Way, are currently being extended to the outer reaches of the Milky Way’s Galactic disk. This meeting will focus on what has been learned about the outer disk of the Milky Way Galaxy beyond the solar circle, with a goal of integrating our picture of the stellar, interstellar, and star forming components of the outer limits of the Milky Way. This first session will give an overview of the Galaxy, including theories of spiral arm structure and dynamics, warps, and the tidal imprints of dwarf companions.

Chair
Thomas M. Bania

1Boston Univ.

203.01 Dynamics of Spirals and Warps
Jerry Sellwood

1Rutgers Univ.

203.02 Old Stars in the Outer Disk of the Galaxy: Results from SEGUE
Constance M. Rockosi

1University of California, Santa Cruz

203.03 Deciphering the Dynamical Echoes of Dwarf Galaxies on the Milky Way Disk
Sukanya Chakrabarti

1Rochester Institute of Technology

203.04 Poster Summaries I
Barbara Whitney

1University of Wisconsin

204 WIYN Observatory - Building on the Past, Looking to the Future: Partnerships

Tuesday, 10:00 AM - 11:30 AM, Wabash Ballroom 1, Indiana Convention Center

As part of its “meeting-in-a-meeting” highlighting the scientific contributions and the new instrumentation available at WIYN, the Observatory partners are providing a forum for discussion of potential partnership arrangements for national 4-meter class telescopes. In this session, WIYN and other operators of 4-meter class telescopes will join in a panel discussion that features their plans for the future, possible strategies for broadening the user base from the community, and potential synergies and partnerships with existing and planned large survey projects and facilities. The intention of this session is to facilitate a conversation within the national community that explores potential future partnership arrangements to provide stable operational models for moderate aperture facilities that currently serve a large user base in the US.

Chair
John J. Salzer

1Indiana University

204.01 WIYN Observatory: Partnerships
John S. Gallagher

1Univ. of Wisconsin
Panel Discussion: WIYN Observatory: Partnerships
Buell Jannuzi\textsuperscript{1, 2}
\textsuperscript{1}Steward Observatory, \textsuperscript{2}University of Arizona

WIYN Observatory: Partnerships
Timothy C. Beers\textsuperscript{1}
\textsuperscript{1}NOAO

WIYN Observatory: Partnerships
Suzanne L. Hawley\textsuperscript{1, 3}, R.A.M. Walterbos\textsuperscript{2, 3}, B.A. Gillespie\textsuperscript{3}
\textsuperscript{1}Univ. of Washington, \textsuperscript{2}New Mexico State University, \textsuperscript{3}Apache Point Observatory

WIYN Observatory: Partnerships
John J. Salzer\textsuperscript{1}
\textsuperscript{1}Indiana University

**Education and Public Outreach Student Event**

Tuesday, 11:30 AM - 2:00 PM, Exhibit Hall D, Indianapolis Convention Center

Local middle- and high- school students will be joining us for an afternoon of hands-on educational activities in the exhibit hall. The students will be welcomed by Gail Zasowski of The Ohio State University presenting a talk on Pursuing STEM Careers. Following a short presentation, the students will be led in groups to participating exhibitors to engage in a hands-on activity.

**205 The Atacama Large Millimeter/submillimeter Array: A New Window on the Universe**

Tuesday, 11:40 AM - 12:30 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
Ed Churchwell\textsuperscript{1}
\textsuperscript{1}University of Wisconsin

**205.01 The Atacama Large Millimeter/submillimeter Array: A New Window on the Universe**

Anthony J. Beasley\textsuperscript{1}
\textsuperscript{1}National Radio Astronomy Observatory

**Splinter Session: Proposal & Observing Prep with NRAO Telescopes**

Tuesday, 12:30 PM - 3:30 PM, Room 107, Indiana Convention Center

Hosted by the National Radio Astronomy Observatory (NRAO) scientific staff, this Splinter Session is designed to assist members of the astronomy community who are unfamiliar with radio-wavelength observing. This Session will provide practical advice and hands-on guidance regarding observing proposals and observation preparation for each of the four state-of-the-art NRAO telescopes: the international Atacama Large Millimeter/submillimeter Array (ALMA), the Jansky Very Large Array (VLA), the Very Long Baseline Array (VLBA), and the Green Bank Telescope (GBT). This Session will feature an overview of on-going and new NRAO telescope and instrument capabilities, interactive walk-throughs for proposing to each facility, and guided hands-on tutorials of the proposal and observing preparation tools for each telescope.

Organizer
Anthony J. Remijan\textsuperscript{1}
\textsuperscript{1}NRAO
206 NASA Town Hall

Tuesday, 12:45 PM - 1:45 PM, Wabash Ballroom 1, Indiana Convention Center

Senior representatives from NASA’s Science Mission Directorate and Astrophysics Division will discuss NASA's science program and outlook. Topics will include the status of the research program, highlights of operating missions, NASA’s response to the Astro2010 Decadal survey, progress of missions in development, and anticipated opportunities for both non-flight basic research awards (grants) and flight mission investigations.

Chair
Paul L. Hertz
1 NASA Headquarters

207 CSWA Town Hall: Unconscious Bias, Stereotype Threat, and Imposter Syndrome

Tuesday, 12:45 PM - 1:45 PM, Wabash Ballroom 3, Indiana Convention Center

Women and other underrepresented groups in astronomy can face a powerful combination of hidden obstacles. With unconscious bias, men and women both unconsciously devalue the contributions of women. This can have a detrimental effect on grant proposals, job applications, and performance reviews. Stereotype threat is the anxiety women face in a situation where they have the potential to confirm a negative stereotype about women as a group. This anxiety alone can result in documented cases of lower scores on standardized math tests. Highly competent women may also face impostor syndrome where they find it impossible to believe in their own competence. They live with a fear of being discovered.

The CSWA Town Hall at the Indianapolis AAS meeting will discuss these issues in the context of the AAUW report entitled, "Why So Few? Women in Science, Technology, Engineering, and Mathematics." The Town Hall will include at least 30 minutes for discussion and answering questions from the audience.

Chair
Joan T. Schmelz
1 Univ. of Memphis

Open Event: Pluto's Demise and Resurrection

Tuesday, 1:30 PM - 2:00 PM

In 2006 The International Astronomical Union re- evaluated the definition of a planet which resulted in Pluto’s demotion from the Planetary Pantheon. With the upcoming rendezvous of New Horizons with Pluto, passions still run high regarding whether Pluto should be considered a planet. In this presentation, the rationale behind Pluto’s demise from planethood, and its reclassification/resurrection as something much more exciting will be explained.

Organizer
Angela Speck
1 University of Missouri

208 Galaxies and AGN I

Tuesday, 2:00 PM - 3:30 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
Joseph Richards
1 Purdue University
**Determination of Physical Parameter Estimates for Metal-Poor Stars from the HK and HES Surveys**

Timothy C. Beers¹, Y. Lee², V. Placco³, D. Carollo⁴, N. Christlieb⁵, S. Fiorenza⁶

¹NOAO, ²New Mexico State University, ³University of Sao Paulo, Brazil, ⁴Macquarie University, Australia, ⁵University of Heidelberg, Germany, ⁶City University of New York

**The Origin of the Diffuse UV Light from Spiral Disks: The Case of M101**

Alison F. Crocker¹, R. Chandar¹

¹University of Toledo

**Chemical Abundances Of Spirals (CHAOS): A Spectroscopic Survey of HII Regions in Nearby Spiral Galaxies**

Kevin V. Croxall¹, R.W. Pogge¹, E.D. Skillman², D. Berg², J. Moustakas³

¹Ohio State University, ²University of Minnesota, ³Siena College

**Transformation of the Virgo Dwarf Irregular Galaxy IC3418 by Ram Pressure Stripping**

Jeffrey D. Kenney¹

¹Yale University

**WITHDRAWN: Testing Numerical Star Formation Prescriptions in Galaxy Mergers**

George C. Privon¹,², J.M. Mazzarella¹, J.E. Barnes³, A.S. Evans¹-⁴, J.E. Hibbard⁴, L. Armus³, S.D. Lord³, GOALS Team

¹University of Virginia, ²Infrared Processing & Analysis Center, ³Institute for Astronomy, ⁴National Radio Astronomy Observatory

**WITHDRAWN: The Evolution in the Molecular Gas Content of Luminous Infrared Galaxies at z = 0.25−0.65**

Kimberly S. Scott¹, K. Sheth¹, N. Scoville², J.S. Kartaltepe³, L. Yan⁴, D.B. Sanders⁵, E. Schinnerer³, P. Jablonka¹, F. Combes⁸

¹NRAO/NAASC, ²Caltech, ³NOAO, ⁴IPAC/Caltech, ⁵University of Hawaii, ⁶MPIA, Germany, ⁷Meudon Observatory, France, ⁸Paris Observatory, France

**Nurturing Lyman Break Galaxies: Observed Links Between Environment and Spectroscopic Features**

Jeff Cooke¹, Y. Omori², E. Ryan-Weber¹

¹Swinburne University, Australia, ²McGill University, Canada

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**209 Supernovae and Neutron Stars**

Tuesday, 2:00 PM - 3:30 PM, Room 116, Indiana Convention Center

Chair

David Sand¹

¹UC Santa Barbara

**Three-Dimensional Simulations of Core-Collapse Supernovae**

Sean M. Couch¹

¹University of Chicago

**Supernova Simulations with a Quark-Gluon Plasma Phase Transition in the NDL Equation of State**

J. Pocahontas Olson¹, M. Meixner¹, G.J. Mathews¹, L. Nguyen², H.E. Dalhed³

¹University of Notre Dame, ²Hanoi National University of Education, Viet Nam, ³Lawrence Livermore National Laboratory

**A Sterile Neutrino and its Consequences for Core-Collapse Supernovae**

MacKenzie Warren¹, M. Meixner¹, G.J. Mathews¹, J. Hidaka², T. Kajino²

¹University of Notre Dame, ²National Astronomical Observatory of Japan, Japan
209.04 A Light Echo Candidate from Supernova 2009ig
Peter M. Garnavich¹, P. Milne², G.L. Bryngelson³, M.D. Leising⁴
¹Univ. of Notre Dame, ²University of Arizona, ³Francis Marion University, ⁴Clemson University

209.05 EQ Lyn and V455 And: Contrasts in Post-Outburst Behavior
Paula Szkody¹, A.S. Mukadam¹, B.T. Gaensicke²
¹Univ. of Washington, ²University of Warwick, United Kingdom

209.06 Gravitational and Electromagnetic Emission from Binary Neutron Star Mergers
Patrick M. Motl¹, C. Palenzuela², L. Lehner³, M. Ponce⁴, S.L. Liebling⁵, M. Anderson⁶, D. Neilsen⁷
¹Indiana University Kokomo, ²CITA, Canada, ³Perimeter Institute, Canada, ⁴University of Guelph, Canada, ⁵Long Island University, ⁶Indiana University, ⁷Brigham Young University

209.07 Search for an X-ray Counterpart to VER J2019+407
Mark F. Theiling¹, V. Dwarkadas³, A. Weinstein²
¹Purdue University, ²Iowa State University, ³University of Chicago

209.08 Pulsars in the Laboratory: Practical Superluminal Emitters Mimic Their Galactic Cousins
John Singleton¹, A.C. Schmidt², J. Middleditch², S. Redman², J. Wigger², H. Ardavan³, A. Ardavan⁴
¹National High Magnetic Field Laboratory, ²Los Alamos National Laboratory/UNM, ³Cambridge University, United Kingdom, ⁴Oxford University, United Kingdom

209.09 On the Anatomy of a Point-charge in Superluminal Rotation and Its Relevance to Pulsar Radiation
Andrea C. Schmidt¹, J. Singleton², J. Middleditch¹, H. Ardavan³, A. Ardavan⁴
¹LANL/UNM, ²National High Magnetic Field Laboratory, ³Cambridge University, United Kingdom, ⁴Oxford University, United Kingdom

210 Bridging Laboratory and Astrophysics: Plasmas
Tuesday, 2:00 PM - 3:30 PM, Room 117, Indiana Convention Center

Laboratory astrophysics is the Rosetta Stone that enables astronomers to understand and interpret the cosmos. This session will focus on the interplay between astrophysics with theoretical and experimental studies into the underlying plasma processes which drive our Universe.

Chair
R. Paul Drake¹
¹Univ. of Michigan

210.01 Laboratory Studies of Supersonic Magnetized Plasma Jets and Radiative Shocks
Sergey Lebedev¹
¹Imperial College, United Kingdom

210.02 First-Principles Computer Simulations of Dense Plasmas and Application to the Interiors of Giant Planets
Burkhard Militzer¹
¹University of California, Berkeley

210.03 Laser-Driven Magnetic Pistons Relevant to the Formation of Magnetized Collisionless Shocks
Erik Everson¹, A. Bondarenko¹, D. Schaeffer¹, C. Constantin¹, S. Vincena¹, B. Van Compernolle¹, S. Clark¹, D. Winske², C. Niemann¹
¹UCLA, ²Los Alamos National Laboratory
Tuesday Sessions and Events

210.04  A Two-dimensional Multimode RM Experiment on OMEGA-EP
Carlos Di Stefano1, G. Malamud1,2, C.C. Kuranz2, S. Klein1, M. Grosskopf1, P. Keiter1, R. Drake1
1University of Michigan, 2Nuclear Research Center - Negev, Israel

211 Outer Limits of the Milky Way II: Star Formation
Tuesday, 2:00 PM - 3:30 PM, Wabash Balloom 3, Indiana Convention Center
This session will review star formation of the Outer Galaxy: Using radio and Spitzer observations to map the Outer star formation disk, comparing the distribution of H II regions to H I and CO distributions, and reviewing characteristics of star formation in the Outer Galaxy.

Chair
Joseph L. Hora1
1Harvard-Smithsonian, CfA

211.01  Star Formation Beyond the Solar Circle: A Survey of Surveys
Charles R. Kerton1
1Iowa State University

211.02  The BeSSeL Survey and the Outer Milky Way
Alberto Sanna1, M.J. Reid2, K. Menten1, BeSSeL Survey Team
1Max Planck Institute for Radio Astronomy, Germany, 2Harvard-Smithsonian CfA

211.03  Distant HII Regions in the Outer and Outer Scutum Centaurus Arms
Loren D. Anderson1, T.M. Bania2, D.S. Balser3, T. Wenger2
1West Virginia University, 2Boston University, 3NRAO

211.04  Poster Sumaries II
Barbara Whitney1
1University of Wisconsin

212 Computation as a Bridge between the Laboratory and Astrophysics
Tuesday, 3:40 PM - 4:30 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
R. Paul Drake1
1Univ. of Michigan

212.01  Computation as a Bridge between the Laboratory and Astrophysics
Robert Rosner1, F. Cattaneo1
1Univ. of Chicago

213 The X-ray Background and the Cosmic History of Black Hole Growth
Tuesday, 4:30 PM - 5:20 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
Ed Churchwell1
1University of Wisconsin

213.01  The X-ray Background and the Cosmic History of Black Hole Growth
Guenther Hasinger1
1University of Hawaii
Public Event: Discovering Planets From Your Sofa: Adventures in Citizen Science

Tuesday, 8:00 PM - 9:00 PM, Wabash Ballroom 1, Indiana Convention Center

Overwhelmed by the flood of information we can now obtain about the cosmos, astronomers are turning to the public for help. A flood of hundreds of thousands of citizen scientists have classified galaxies, surveyed the Milky Way, discovered clusters of stars in the Andromeda Galaxy and even been the first to find planets around other stars. This talk, by Chris Lintott (University of Oxford & Adler Planetarium) will share these success stories, and look into the future to a time when humans will collaborate with astronomically-minded robots.

Organizer
Chris Lintott¹

¹University of Oxford & Adler Planetarium
Tuesday Posters

214 WIYN Observatory - Building on the Past, Looking to the Future
Tuesday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center

214.01 Wind Variability in BZ Cam
R. K. Honeycutt, S. Kafka, J.W. Robertson
1Indiana Univ., 2Carnegie Institute, 3Arkansas Tech University

214.02 The Shell-Shocked Interstellar Medium Near Cygnus X-1
1The University of Wisconsin-Madison, 2University of Indiana-Bloomington, 3University of Amsterdam, Netherlands, 4University of Michigan, 5University of Southampton, United Kingdom, 6Massachusetts Institute of Technology

214.03 The WIYN Open Cluster Study: A 15-Year Report
Robert D. Mathieu, WOCS Collaboration
1Univ. of Wisconsin

214.04 WIYN Open Cluster Study: Radial Velocity Membership of the Evolved Population of Open Cluster NGC 6791
Benjamin M. Tofflemire, N.M. Gosnell, R.D. Mathieu
1University of Wisconsin - Madison

214.05 Surface Abundances of NGC 188 Blue Stragglers as a Clue to Formation History
Katelyn Milliman, R.D. Mathieu, S.C. Schuler
1University of Wisconsin-Madison, 2University of Tampa

214.06 Radial Velocities of Three Relatively Unstudied Open Clusters
Christian R. Hayes, E.D. Friel
1Indiana University

214.07 Deep Near-infrared Photometry of Little-studied Old Open Clusters
Zachary Catlin, E.D. Friel, H.R. Jacobson
1Indiana University, 2Massachusetts Institute of Technology

214.08 A Study of Evolved Stars in the Open Cluster NGC 7789
Jamie C. Overbeek, E.D. Friel, H.R. Jacobson, C.A. Pilachowski
1Indiana University, 2MIT

214.09 A Kinematical Study of M13
Maria J. Cordero, C.A. Pilachowski, C.I. Johnson, C.P. Deliyannis
1Indiana University, 2University of California at Los Angeles

214.10 Kinematics of the Globular Cluster System of the Sombrero Galaxy
Jessica L. Windschitl, K.L. Rhode, T.J. Bridges, S.E. Zepf, K. Gebhardt, K.C. Freeman
1Indiana University, 2Queen's University, Canada, 3Michigan State University, 4University of Texas at Austin, 5Australian National University, Mount Stromlo Observatory, Australia

214.11 Deep Halpha Imaging of Nearby Starbursting Dwarf Galaxies
Liese van Zee, K.B. McQuinn, E.D. Skillman, P.L. Moravec
1Indiana Univ., 2University of Minnesota

214.12 Optical Imaging of Extended Star Formation in Nearby Spiral Galaxies with the One Degree Imager
Jenna E. Ryon, R.C. Kotulla, J.S. Gallagher
1University of Wisconsin - Madison, 2University of Wisconsin - Milwaukee
214.13 The Evolutionary Status of Blue Compact Dwarf Galaxies: I. Surface Photometry
Steven Janowiecki1, J.J. Salzer1
1Indiana University

214.14 Probing Galaxy Evolution with Spatially Resolved Spectral Energy Distribution (SED) Fitting Techniques
John S. Gallagher1, R.C. Kotulla2
1Univ. of Wisconsin, 2University of Wisconsin

214.15 The ALFALFA Hα Survey
Angela Van Sistine1, J.J. Salzer1, S. Janowiecki1, A. Sugden2, M.P. Haynes3, R. Giovanelli3, E.M. Wilcots4
1Indiana University, 2Brown University, 3Cornell University, 4University of Wisconsin

214.16 Optical Imaging of HI-selected Local Group Galaxy Candidates with pODI
1Cornell University, 2Macalester College, 3Universidad de Chile, Chile, 4Indiana University

214.17 Stellar Populations of Quasar Host Galaxies Using WIYN
Gregory Mosby1, E. Moravec2, R.C. Kotulla3
1University of Wisconsin, Madison, 2St. Olaf College, 3University of Wisconsin, Milwaukee

214.18 Gas and Galaxies in the Cosmic Web: A WIYN/HYDRA Galaxy Redshift Survey around HST/COS Target Sight Lines
Brian A. Keeney1, J.T. Stocke1, D. Syphers1, H. Yamamoto1, B.P. Wakker2, B.D. Savage2, S.V. Penton1,3, J.C. Green1
1Univ. of Colorado, 2Univ. of Wisconsin, 3STScI

214.19 Broad- and Narrow-Band Wide-Field Imaging with pODI
John J. Salzer1, S. Janowiecki1
1Indiana University

214.20 Imaging Main Belt Comets and Asteroids with the WIYN pODI Camera
Jayadev Rajagopal1, D. Jewitt2, S.E. Ridgway1
1NOAO, 2UCLA

214.21 A Fast On-the-fly Data Reduction Pipeline for Rapid Inspection of pODI Data
Ralf C. Kotulla1, One Degree Imager Commissioning Working Group
1University of Wisconsin - Milwaukee

214.22 pODI at WIYN: Instrument Performance and Upgrade Path
Daniel R. Harbeck1, T.A. Boroson2, R. Rajagopal2, ODI Team, PPA Team
1WIYN Observatory, 2NOAO

214.23 The Contributions of the WIYN Telescope to Advanced Degrees
Eric Hooper1
1Univ. of Wisconsin - Madison

215 AGN, QSO, Blazars

Tuesday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center

215.01 Reddening and Absorption in Mrk 231
Karen Leighly1, D.M. Terndrup2, M. Dietrich3, A.B. Lucy1, S. Gallagher4, E.A. Baron1
1Univ. of Oklahoma, 2Ohio State University, 3Ohio University, 4University of Western Ontario, Canada

215.02 An Exceptional Radio Flare in Markarian 421
1Purdue University, 2Caltech, 3Max-Planck-Institut-für-Radioastronomie, Germany, 4University of Michigan, 5Istituto di Radioastronomia, Italy
215.03 Interpretation of Blazar Micro-Variability as Turbulent Jets
James R. Webb¹, D. Laurence¹, G. Bhatta¹, S.M. Dhalla¹, O. Harrington¹
¹Florida International Univ.

215.04 Time Series Analysis of the Blazar OJ 287
Ellen Gamel¹, W.T. Ryle¹, M.T. Carini²
¹Thomas More College, ²Western Kentucky University

215.05 Quasar Composite Spectra With BOSS
David Harris¹, K.S. Dawson¹, A.D. Myers²
¹University of Utah, ²University of Wyoming

215.06 X-ray Emission from Black Holes at the Centers of Nearby Dwarf Galaxies
Madeleine Manheim¹, E.C. Moran¹, S.M. LaMassa²
¹Wesleyan University, ²Yale University

215.07 Statistical Analysis of the Long Baseline Variability Properties of a Large Gamma-Ray Selected Blazar AGN Sample
Chris R. Shrader¹
¹NASA's GSFC

215.08 Highlights from the VERITAS Blazar Observation Program
Qi Feng¹, W. Cui¹, VERITAS Collaboration
¹Purdue University

215.09 MOJAVE: Parsec-Scale Kinematics Analysis of AGN Jets from 1994 to 2011
Matthew L. Lister¹, MOJAVE Collaboration
¹Purdue Univ.

216 The ISM and Objects Therein
Tuesday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center

216.01 Si IV Column Densities Predicted from Non-Equilibrium Ionization Simulations of Turbulent Mixing Layers and High-Velocity Clouds
Kyujin Kwak¹, ², R.L. Shelton², D. Henley²
¹Ulsan National Institute of Science and Technology, Republic of Korea, ²University of Georgia

216.02 Detecting the Rapidly Expanding out Shell of the Crab Nebula: Where to Look
Xiang Wang¹, G.J. Ferland¹, J.A. Baldwin², E.D. Loh², C.T. Richardson²
¹University of Kentucky, ²Michigan State University

216.03 WITHDRAWN: The Relationship Between PAH Emission and Gas Tracers in the Large Magellanic Cloud
Tony H. Wong¹, R. Xue¹, B. Whitney², F. Heitsch³, A. Hughes⁴, A.D. Bolatto⁵, T. Robitaille⁶
¹University of Illinois, ²University of Wisconsin-Madison, ³University of North Carolina, ⁴Max Planck Institute for Astronomy, Germany, ⁵University of Maryland

216.04 OH+ in Diffuse Molecular Clouds
Steven R. Federman¹, A.J. Porras¹, D.E. Welty³, A.M. Ritchey³
¹Univ. of Toledo, ²Univ. of Chicago, ³Univ. of Washington

216.05 Determining the Nonmetastable Ammonia Populations in NGC 7538 Using the Green Bank Telescope
Spenser Joyce¹, I.M. Hoffman¹
¹Wittenberg University

216.06 The Dissipation Range of Interstellar Turbulence
Steven R. Spangler¹, J.J. Buffo¹
¹Univ. of Iowa
<table>
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<th>Session</th>
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<td>1Western Illinois University, 2Yale University, 3NAIC, Arecibo Observatory, 4University of Puerto Rico, 5Cal. State Univ. Stanislaus</td>
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<td>216.08</td>
<td>Multispectral Imaging and Analysis of the Rosette Nebula</td>
<td>Jeremy Huber1, 2, J.F. Kielkopf1, G.J. Ferland2, F.O. Clark3</td>
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<td>1University of Louisville, 2University of Kentucky, 3Spectral Sciences Inc</td>
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<td>216.09</td>
<td>Cooling Function in Wide Range of Density and Metallicity</td>
<td>Ye Wang1, G.J. Ferland1</td>
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<td>216.10</td>
<td>A Systematic Search for Infall Signatures Towards the Starless Core Population in the Perseus Molecular Cloud</td>
<td>Amanda Walker-LaFollette1, 2, Y.L. Shirley1, 3, A.P.M. Towner1, L.I. Biddle1, C. Smith1, H. Amaya1, S.L. Becker1, M. Lichtenberger1, M.N. Nieberding1, B.A. Raphael1, J.M. Romine1, L. Small1, C. Stanford-Jones1, R. Thompson1, J. Turner1, Z. Watson1, I. Cates1, M. Daugherty1, J. Haberstroh1, M. Kwon1, A.M. McGraw1, L. Mouren-Laurens1, K. Pearson1, A. Robertson1, B. Sanford1, A.D. Scott1, T.G. Smith1, R. Tombrelen1</td>
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<td>1University of Arizona, 22012-2013 NASA Space Grant Intern Advisor, 3Adjunct Astronomer, National Radio Astronomy Observatory, 4Arizona Radio Observatory</td>
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<td>216.11</td>
<td>Computational and Observational Studies of Interstellar Thioformaldehyde Masers</td>
<td>Lisa Simpson1, I.M. Hoffman1</td>
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<td>1Wittenberg University</td>
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<td>216.12</td>
<td>The WISE Catalog of Galactic HII Regions</td>
<td>Loren D. Anderson1</td>
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<td>216.13</td>
<td>Modeling the Extended Dust Shell Around AFGL 618</td>
<td>Laura Hosmer1, A. Speck1, M. Meixner2, D.C. Lis3, M.M. Nenkova4, M. Elitzur5</td>
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<td>1University of Missouri-Columbia, 2Space Telescope Science Institute, 3California Institute of Technology, 4Seneca College of Applied Arts and Technology, Canada, 5University of Kentucky</td>
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<td>216.14</td>
<td>Investigating the Variance of Mid-infrared Dust Spectral Features of Oxygen-rich AGB Stars</td>
<td>Adam Eshein1, A. Speck1</td>
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<td>1University of Missouri, Columbia</td>
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<td>216.15</td>
<td>Modeling the Mineralogy of Dust Around Obscured, Oxygen-rich AGB Star, IRAS 17495-2534</td>
<td>David Nash1, A. Speck1</td>
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<td>1University of Missouri</td>
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### 217 Extrasolar Planets & Tools

**Tuesday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center**

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<td>Jay M. Pasachoff1, G. Schneider1, B.A. Babcock1, M. Lu1, M.J. Penn1, S.A. Jaeggli2, E. Galayda3, 4, K.P. Reardon5, 6, T. Widemann7, P. Tanga1, D. Ehrenreich8, A. Vidal-Madjar9, P.D. Nicholson10, R. Dantowitz11</td>
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<td>1Williams College, 2Steward Obs/U Ariz, 3NSO, 4NSO, 5Montana State U, 6LESIA/UMR8109, France, 7Obs. de la Côte d’Azur, France, 8Geneva Obs., Switzerland, 9Inst d’Astrophysique, France, 10Cornell U., 11Clay Center Obs., 12Arcetri Astrophysical Observatory / INAF, Italy, 13U. Michigan</td>
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TUESDAY POSTER SESSIONS

217.02 Flying Toasters: Heating Exoplanets Via The Stellar Wind
Derek L. Buzasi
Florida Gulf Coast University

217.03 Habitability in Binary Systems: The Role of UV Reduction and Magnetic Protection
Joni Clark, P.A. Mason, J.I. Zuluaga, P.A. Cuartas, S. Bustamonte
New Mexico State University, University of Texas El Paso, University of Antioquia, Colombia

217.04 The University of Arizona Astronomy Club Follow-up Observations of Transiting Extra-solar Planet HAT-P-36b
Robert Thompson, J. Turner, C. Jones, K. Pearson, L.I. Biddle, M. Berube
University of Arizona

217.05 Optical Observations of the Transiting Exoplanet GJ 1214b
Jake Turner, J. Teske, M. Mueller, C.A. Griffith
University of Arizona, Leibniz-Institut für Astrophysik Potsdam, Germany

217.06 SpiKeS - The Spitzer-Kepler Survey
JPL, SSIC/IPAC, NExSci/IPAC, DTM, University of Cambridge, United Kingdom

217.07 Using Proxy Stars to Reduce Radius and Temperature Estimates for Low-Mass Kepler Objects of Interest
Justin Brown, S. Ballard
University of Washington, Carl Sagan Fellow

217.08 Measuring the Magnetic Field Strength of the Transiting Extra-solar Planet TrES-2b Using Near-UV Observations
Ian Cates, J. Turner, K. Pearson
University of Arizona

217.09 Near UV Observation of HAT-P-16b
Kyle Pearson, J. Turner
University of Arizona

217.10 A Systematic Search for Secondary Eclipses in the Kepler Dataset
Emily DeLarme, D. Angerhausen
Rensselaer Polytechnic Institute

217.11 Transit Planet Spectrophotometry with a Contaminated Target
Will I. Clarkson, T.L. Tobin
Indiana University, Bloomington

217.12 Exoplanet Observations in SOFIA’s Cycle 1
Daniel Angerhausen
RPI

217.13 Testing a Method of Detecting a Magnetic Field of Transiting Hot-Jupiter CoRoT-1b
Lauren I. Biddle, J. Turner, K. Pearson, J. Teske
University of Arizona

217.14 Eclipsing Binaries and the Search for Circumbinary Exoplanets in Kepler Data
Anna Hughes, D. Angerhausen
Rensselaer Polytechnic Institute

217.15 A Search for Exoplanets in Short-Period Eclipsing Binary Star Systems
Ronald H. Kaitchuck, G. Turner, J.M. Childers
Ball State Univ., University of Alabama, Boonshoft Museum of Discovery
217.16 Innovations for Exoplanet Data Acquisition
Emily Ranquist¹, D.C. Stephens¹, J. Rawlins¹
¹Brigham Young University

Brett M. Morris¹,², H. Katz², OSCAAR Team
¹NASA's Goddard Space Flight Center, ²University of Maryland

217.18 WCO Observations of KELT Candidates
Ryan L. Avril¹, S.N. Mellon¹, S.A. Mauri¹, T.E. Oberst¹, KELT
¹Westminster College

218 Pulsars and Neutron Star
Tuesday, 9:00 AM - 6:30 PM, Exhibit Hall D, Indiana Convention Center

218.01 The Motion of Cassiopeia A's Neutron Star
Tracey DeLaney¹, J. Satterfield¹, S. Chatterjee²
¹West Virginia Wesleyan College, ²Cornell University

218.02 New Radio Pulsars in the Large Magellanic Cloud
Joshua Ridley¹, D. Lorimer³, S. Bailey², F. Crawford¹, J. Madden³, R. Anella³
¹Murray State University, ²West Virginia University, ³Franklin & Marshall College

218.03 Limits on Lorentz Invariance Violation from VERITAS Using the Crab Pulsar Profile
John P. Finley¹, VERITAS Collaboration
¹Purdue Univ.

218.04 Search for Very High Energy Radiation in Black-Widow Type Millisecond Pulsar Systems
John Millis¹, VERITAS Collaboration
¹Anderson University

218.05 VERITAS Studies of the TeV Emission from MGRO J1908+06/HESS J1908+063
Daniel D. Gall¹, VERITAS Collaboration
¹University of Iowa

218.06 Pulsar-driven Jets in the Early Universe and Element Enrichment
John Middleditch¹
¹LANL
Wednesday Sessions and Events

WEDNESDAY

Session Chair Breakfast
Wednesday, 7:30 AM - 8:00 AM, Room 107, Indiana Convention Center

300 The Latest Results from the NASA Kepler Mission: Exoplanets and Astrophysics
Wednesday, 8:30 AM - 9:20 AM, Wabash Ballroom 1, Indiana Convention Center

Chair
Paula Szkody  
University of Washington

300.01 The Latest Results from the NASA Kepler Mission: Exoplanets and Astrophysics
Steve B. Howell  
NASA ARC

301 Bridging Laboratory and Astrophysics: Planetary
Wednesday, 10:00 AM - 11:30 AM, Room 117, Indiana Convention Center

Laboratory astrophysics is the Rosetta Stone that enables astronomers to understand and interpret the cosmos. This session will focus on the interplay between astrophysics with theoretical and experimental studies into the underlying planetary science processes which drive our Universe.

Chair
Murthy Gudipati  
Jet Propulsion Laboratory

301.01 Water Ice in Comets: A Comparative Study
Silvia Protopapa 1, J. Sunshine 1, L.M. Feaga 1, M.S. Kelley 1, M.F. A’Hearn 1, T. Farnham 1, DIXI Team  
University of Maryland

301.02 The Importance of Accurate Atomic and Molecular Line-lists for Characterizing Exoplanetary Atmospheres
Nikkhu Madhusudhan 1, R. Freedman 2, 3, J. Tennyson 4  
Yale University, SETI Institute, NASA Ames Research Center, University College London, United Kingdom

301.03 Investigating Titan’s Atmospheric Chemistry at Low Temperature in Support of the NASA Cassini Mission
Ella Sciamma-O’Brien 1, F. Salama 1  
NASA Ames Research Center

302 Extrasolar Planets & Tools
Wednesday, 10:00 AM - 11:30 AM, Wabash Ballroom 1, Indiana Convention Center

Chair
Nikole Lewis 1  
University of Arizona

302.01 Astrometry with the Kepler Planet Finder - A Progress Report
G. F. Benedict 1  
Univ. of Texas, Austin
Wednesday Sessions and Events

302.02 The Atmospheric Circulation of the Eccentric Hot-Jupiter HAT-P-2b
Nikole Lewis1, A.P. Showman2, J.J. Fortney3, H. Knutson4, M.S. Marley5
1MIT, 2University of Arizona, 3UCSC, 4Caltech, 5NASA/Ames

302.03 KELT-6b: A Transiting Mildly-Inflated Saturn with a Metal-Poor Host
1University of Louisville, 2Kentucky Space Grant Graduate Fellowship, 3Vanderbilt University, 4The Ohio State University, 5Fisk University, 6Las Cumbres Observatory Global Telescope Network, 7University of California, 8Harvard-Smithsonian Center for Astrophysics, 9University of Copenhagen, Denmark, 10Natural History Museum of Denmark, 11Swarthmore College, 12Spot Observatory, 13Princeton University, 14University of Notre Dame, 15Boston University, 16University of Hawaii, 17Pennsylvania State University, 18Texas A&M University, 19Winer Observatory, 20Atalanta Group & Crow-Observatory, Portugal, 21Westminster College, 22Wellesley College, 23Montgomery Bell Academy, 24Societa Astronomica Lunae, Italy, 25Lehigh University

302.04 Measuring Masses and Densities of Small Planets found by NASA’s Kepler Spacecraft with Radial Velocity Measurements from Keck/HIRES
Howard T. Isaacson1, G. Marcy1, J. Rowe2, Kepler Team
1University of California at Berkeley, 2NASA Ames Research Center

302.05 Habitability in Binary Systems
Paul A. Mason1,3, J. Clark1, P.A. Cuartas2, J.J. Zuluaga2, S. Bustamante2
1Univ. Of Texas at El Paso, 2Universidad de Antioquia, Colombia, 3New Mexico State University

303 Outer Limits of the Milky Way III: Mapping Galactic Structure in Stars and Dust

Wednesday, 10:00 AM - 11:30 AM, Wabash Balloon 3, Indiana Convention Center

This session will review observations that have mapped spiral arms, the Galactic warp and truncation radius, and determined the dust and stellar structure of the Outer Galaxy. We will conclude the meeting with a Q&A discussion.

Chair
Edward B. Churchwell1
1Univ. of Wisconsin

303.01 Exploring Substructure in the Milky Way's Midplane
David L. Nidever1,2, S.R. Majewski3, G. Zasowski3, APOGEE
1University of Michigan, 2University of Virginia, 3University of Ohio

303.02 Exploring the Milky Way Disk Through Stellar Clusters and Diffuse Interstellar Bands
Gail Zasowski1
1The Ohio State University

303.03 GLIMPSE360: Completing the Mid-Infrared View of the Galactic Disk
Robert A. Benjamin1,2, GLIMPSE360 Team
1Univ. of Wisconsin, Whitewater, 2University of Wisconsin - Madison

303.04 Meeting Summary and Discussion
Barbara Whitney1
1University of Wisconsin

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304 Stars, Cool Dwarfs, and Brown Dwarfs

Wednesday, 10:00 AM - 11:30 AM, Room 116, Indiana Convention Center

Chair
Donald M. Terndrup
Ohio State Univ.

304.01 RECONS Answers Fundamental Questions in the Solar Neighborhood
RECONS, Georgia State University, University of Virginia, Northern Arizona University, American Museum of Natural History, Hunter College, USNO

304.02 A Pathway to Earth-like Worlds: Overcoming Astrophysical Noise due to Convection
Heather M. Cegla, C. Watson, S. Shelyag, M. Mathioudakis
Queen's University Belfast, United Kingdom, Vanderbilt University, Monash University, Australia

304.03 A Theory on the Possible Convective Origins of Active Longitudes on Solar-like Stars
Maria A. Weber, Y. Fan, M.S. Miesch
High Altitude Observatory, Colorado State University

304.04 A Fundamental Photometric Variability Sequence Tracing the Evolution of Sun-like Stars
Fabienne A. Bastien, K. Stassun, G.S. Basri, J. Pepper
Vanderbilt University, Fisk University, University of California, Lehigh University

304.05 Prospects for Unprecedented Imaging of Stellar Surfaces with the NPOI
New Mexico Tech, Naval Research Laboratory, Seabrook Engineering, Lowell Observatory, Naval Observatory Flagstaff Station

305 Recent Advances in Our Understanding of Star Formation

Wednesday, 11:40 AM - 12:30 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
Ed Churchwell
University of Wisconsin

305.01 Recent Advances in Our Understanding of Star Formation
Bruce Elmegreen
IBM Research Div.

306 LAD Business Meeting

Wednesday, 12:45 PM - 1:45 PM, Room 117, Indiana Convention Center

The Steering Committee of the Laboratory Astrophysics Division (LAD) invites you to the annual LAD Business Meeting. We will describe the functioning of LAD, report on the activities of the division during the past year, and discuss potential issues for the coming year. Additionally, we will introduce the results of the first election for the LAD Committee Officers and Members-at-Large. The session will be collectively chaired by the LAD Steering Committee.

Chair
Daniel W. Savin
Columbia Astrophysics Lab
307 New Strategic Framework: NOAO
Wednesday, 12:45 PM - 1:45 PM, Wabash Balloom 3, Indiana Convention Center

The NSF Astronomy Portfolio Review proposed a new strategic framework for NOAO. Join us for a discussion of the latest strategic guidance from NSF and how NOAO must evolve as a consequence. Status updates about DES/DECam, BigBOSS, Gemini, and LSST will be also presented. Significant time will be set aside to address community concerns raised by the Portfolio Review and to answer other questions from the audience.

Chair
David R. Silva1
1National Optical Astronomy Observatory

308 Bridging Laboratory and Astrophysics: Nuclear
Wednesday, 2:00 PM - 3:30 PM, Room 117, Indiana Convention Center

Laboratory astrophysics is the Rosetta Stone that enables astronomers to understand and interpret the cosmos. This session will focus on the interplay between astrophysics with theoretical and experimental studies into the underlying nuclear processes which drive our Universe.

Chair
Nancy S. Brickhouse1
1Harvard-Smithsonian, CfA

308.01 Late Time Signatures of Core Collapse Supernovae and Their Interplay with Nuclear Physics
Luke Roberts1
1Caltech

308.02 Understanding Cosmic Explosions in the Laboratory
Fernando Montes1,2
1National Superconducting Cyclotron Laboratory, 2Joint Institute for Nuclear Astrophysics

309 Galaxies and AGN II
Wednesday, 2:00 PM - 3:30 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
Liese van Zee1
1Indiana Univ.

309.01 WITHDRAWN: Feeding AGN with AGB Star Winds
Jason Melbourne1, R. Davies2, K.M. Jones3
1Caltech, 2Max Planck Institut, Germany, 3University of Virginia

309.02 Companion Galaxies of Radio AGN: Insights into AGN Fueling and Feedback
Cameron Pace1, S. Salim1
1Indiana University

309.03D Characterizing the Temperature Distributions of 62 Galaxy Clusters with XMM-Newton
Kari A. Frank1, J.R. Peterson1, K. Andersson2, A.C. Fabian1, J.S. Sanders3
1Purdue Univ., 2Department of Physics, Ludwig-Maximilians-Universität, Germany, 3Institute of Astronomy, United Kingdom
309.04 Discovery of a Sub-kpc Scale Binary AGN Candidate
Jong-Hak Woo¹, H. Cho¹, B. Husemann², S. Komossa³, V. Bennert⁴, D. Park¹
¹Seoul National University, ²Leibniz-Institute for Astrophysics Potsdam, Germany, ³Max-Plank Institute for Radioastronomy, Germany, ⁴California Polytechnic State University

309.05 AGN Prospects for the Cherenkov Telescope Array
Markus Boettcher¹, ²A. Reimer³
¹North-West University, South Africa, ²Ohio University, ³University of Innsbruck, Austria

310 Young Stellar Objects, Star Formation and Star Clusters

Wednesday, 2:00 PM - 3:30 PM, Wabash Balloon 3, Indiana Convention Center

Chair
Claudia Cyganowski¹
¹CfA/SAO

310.01 A Wide-Field Census of Young Stars in NGC 6334
Sarah Willis¹, ²M. Marengo¹, L. Allen¹, G.G. Fazio³, H.A. Smith²
¹Iowa State University, ²Harvard-Smithsonian Center for Astrophysics, ³National Optical Astronomical Observatory

310.02 Characterizing a Herschel-detected Sample of Very Red Protostars in Orion
John J. Tobin¹, A.M. Stutz¹, M. Puravankara¹, S. Megeath¹, W.J. Fischer¹, R. Vavrek⁵, D.M. Watson¹, HOPS Team
¹National Radio Astronomy Observatory, ²MPIA, Germany, ³University of Rochester, ⁴University of Toledo, ⁵ESA, Spain

310.03 Probing the Early Evolution of Dust Grains Through Detailed YSO Models
Erica Rodgers¹, A. Cotera², B. Whitney³, ¹Space Science Institute, ²SETI Institute, ³University of Wisconsin

310.04 X-ray Measurements of Variable Accretion onto the Young Star TW Hydrae
Nancy S. Brickhouse¹, S.R. Cranmer¹, A.K. Dupree¹, S.J. Wolk¹, H.M. Guenther¹
¹Harvard-Smithsonian, CfA

310.05 ALMA SiO (5-4) Observations: Protostellar Outflows near Sgr A*
Farhad Yusef-Zadeh¹, M. Royster¹, M. Wardle¹, R. Arendt², H.A. Bushouse¹, D.C. Lis¹, M.W. Pound¹, D.A. Roberts¹, B. Whitney¹, A. Wootten⁷
¹Northwestern University, ²Crest/UMBC/NASA, ³STScI, ⁴Cal Tech, ⁵U. of Maryland, ⁶Space Science Institute, ⁷NRAO, ⁸Macquarie University, Australia

310.06 New Computational Techniques to Determine Ages of LMC Star Clusters from Their Integrated Spectra
Randa Asa’d¹, M.M. Hanson², A.V. Ahumada³
¹American University of Sharjah, United Arab Emirates, ²University of Cincinnati, ³Observatorio Astronomico de la Universidad Nacional de Córdoba,, Argentina

310.07 The Role of Angular Momentum in the Dynamical Evolution of Star Clusters
Anna Lisa Varri¹, E. Vesperini¹, S.L.W. McMillan¹, B. Giuseppe³
¹Indiana University, ²Drexel University, ³Universita' degli Studi di Milano, Italy

311 Curiosity on Mars: The Latest Results from an Amazing Mission

Wednesday, 3:40 PM - 4:30 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
Ed Churchwell¹
¹University of Wisconsin
311.01  Curiosity on Mars: The Latest Results from an Amazing Mission  
Dawn Sumner¹, Mars Science Laboratory Team  
¹University of California, Davis

312 AAS Members’ Meeting  
Wednesday, 4:30 PM - 5:30 PM, Wabash Ballroom 1, Indiana Convention Center
You may think you belong to the AAS, but it’s actually the other way around: the Society belongs to you. So please come to the Annual Business Meeting in Indianapolis to hear about what is up, nominate members to serve on the the very important Nominating Committee and tell us how we can serve you better. To help encourage attendance, we are providing beer, soft drinks and snacks to all attendees. As you sip some local brew, you’ll hear a report on the Society’s finances, learn about new initiatives from the AAS Council, and have a chance to raise and comment on issues of concern to you personally and to the astronomical community more generally. Finally, we’ll welcome our newly elected leaders to their new positions of service for the coming year. Also, the AAS leadership is especially interested in receiving feedback from members on the current metrics established to guide our efforts in accomplishing our strategic goals and mission (http://aas.org/about/strategic_plan).

   Chair  
   David J. Helfand¹  
   ¹Quest University Canada, Canada

AAS Closing Reception  
Wednesday, 5:30 PM - 7:00 PM, Exhibit Hall
Please join us as we close the 222nd AAS Meeting in Indianapolis, and say goodbye to old friends and new, with light refreshments provided. Raffle prizes will be distributed, including an Apogee A8050 CCD Camera and Fitter Wheel valued at $4000.
The posters in sessions 313-318 will remain up from Wednesday at 9:00 am through Thursday at 12:00 pm. All posters must be removed promptly at 12:00pm on Thursday or they will be recycled. The exhibit hall cannot be entered once the heavy equipment is brought onto the floor.

313 Outer Limits of the Milky Way

Wednesday, 9:00 AM - 12:00 PM, Exhibit Hall D, Indiana Convention Center

313.01 The Vertical Structure, Ionization, and Kinematic Structure of Spiral Arm Outflows Inside and Outside the Solar Circle
Martin Gostisha1, R.A. Benjamin1, L.M. Haffner2, A.S. Hill3, K.A. Barger4
1University of Wisconsin-Whitewater, 2University of Wisconsin-Madison, 3CSIRO, Australia, 4University of Notre Dame

313.02 A PanSTARRS-1 Panoramic View of the Galactic Anticenter Structure
Eric F. Bell1, C.T. Slater1, E. Morganson2, E. Schlafly2, D.P. Finkbeiner3, M. Juric4, N. Martin5, H. Rix5, PanSTARRS-1 Consortium
1University of Michigan, 2Max-Planck-Institut fuer Astronomie, Germany, 3Harvard-Smithsonian CfA, 4LSST Corporation, 5Strasbourg Observatory, France

313.03 The Effects of Drag and Tidal Forces on the Orbits of High-Velocity Clouds
Alexandre Fernandes1, R.A. Benjamin1
1University of Wisconsin - Whitewater

313.04 A Search for New Galaxies Hidden Behind the Plane of the Outer Milky Way
Ashton Falduto1, L.A. Zachariasen1, S. Bessler1, R.A. Benjamin1, GLIMPSE360 Team
1University of Wisconsin-Whitewater

313.05 WITHDRAWN: Data Processing for the Spitzer GLIMPSE Surveys
Marilyn Meade1, B.L. Babler1, S. Bracker1, R.A. Benjamin2, R. Indebetouw3, E.B. Churchwell3, C. Watson4, B. Whitney3,5, M.J. Wolff5
1University of Wisconsin, 2University of Wisconsin-Whitewater, 3University of Virginia, 4Manchester University, 5Space Science Institute

313.06 A Sampling from the Spitzer Mapping of the Outer Galaxy
Sean J. Carey1, J.L. Hora2, D.R. Mizuno3, S.S. Shenoy4, K.E. Kraemer5, M.H. Heyer5, A. Noriega-Crespo1, SMOG Collaboration
1IPAC/Caltech, 2Smithsonian Center for Astrophysics, 3Boston College, 4SOFIA Science Center, 5University of Massachusetts

313.07 An Investigation of Mid-Infrared Selected Star Clusters in the Outer Galaxy
Stephanie Bessler1, L.A. Zachariasen1, A. Falduto1, R.A. Benjamin1, GLIMPSE360 Team
1University of Wisconsin-Whitewater

313.08 A Study of HII regions and Star Formation in the Far Outer Galaxy
Jeonghee Rho1, H. Zinnecker2, B. Whitney3
1SETI Institute and NASA Ames Research Center, 2DSI/SOFIA Science Center, 3U. of Wisconsin

313.09 The Mid-Infrared View of Star Formation Regions in the Outer Galaxy
Marta M. Sewilo1,2, B. Whitney1,2, M. Meade1, B.L. Babler3, E.B. Churchwell1, R.A. Benjamin4
1The Johns Hopkins University, 2Space Science Institute, 3University of Wisconsin - Madison, 4University of Wisconsin - Whitewater
313.10 Extended Excess 4.5 μm Sources in the Perseus Arm: First Results from GLIMPSE360
Claudia Cyganowski1, B. Whitney2, T. Robitaille3, M. Meade2, B.L. Babler2,
E.B. Churchwell2, J. Honor2
1CfA/SAO, 2University of Wisconsin-Madison, 3Max Planck Institute for Astronomy,
Germany

313.11 A Search for Star Formation in the Outer Milky Way Galaxy
Loryn A. Zachariasen1, S. Bessler1, A. Falduto1, R.A. Benjamin1, GLIMPSE360 Team
1University of Wisconsin - Whitewater

314 Evolution of Galaxies
Wednesday, 9:00 AM - 7:00 PM, Exhibit Hall D, Indiana Convention Center

314.01 The Structure and Star Formation History of the New Milky Way Satellites and Beyond
David J. Sand1
1Texas Tech University

314.02 Nebular Abundances of Fifteen KISS Star-Forming Galaxies
Alec S. Hirschauer1, J.J. Salzer1
1Indiana University

314.03 Spectroscopic Analysis of Hα Dots
Jesse Feddersen1, J.J. Salzer1, C. Gronwall2
1Indiana University, 2Pennsylvania State University

314.04 Baryonic Distributions in the Dark Matter Halo of NGC3992
Emily E. Richards1, L. van Zee1, D.C. Wavle1, K.L. Barnes1, S. Staudaher2, D.A. Dale3,
D. Calzetti4, J. Dalcanton5, J. Bullock3, R. Chandar6
1Indiana University, 2University of Wyoming, 3University of Massachusetts, 4University of
Washington, 5University of California, Irvine, 6University of Toledo

314.05 Extraplanar Star Formation in Edge-on Spiral Galaxies: H II Region Abundances
Katherine M. Rueff1, J.C. Howk1
1University of Notre Dame

314.06 PNe in M31 as Tracers of the History of the Disk of M31
Bruce Balick1, K.B. Kwitter2, R.B.C. Henry1, K.B. Kwitter2
1Univ. of Washington, 2Williams College, 3University of Oklahoma

314.07 Oxygen Abundance Measurements of SHIELD Galaxies
Nathalie C. Haurberg1, 2, J.J. Salzer1, J.M. Cannon2
1Indiana University Bloomington, 2Knox College, 3Macalester College

314.08 A Generalized Software Approach to Monte Carlo Constraint of Luminosity Function Evolutionary Parameters
Noah Kurinsky1, A. Sajina1
1Tufts University

314.09 Mass Dependent Galaxy Transformation Mechanisms In The Complex Environment Of SuperGroup Abell 1882
Aparajita Sengupta1, W.C. Keel1, G.E. Morrison2, 3, R.A. Windhorst4, B.M. Smith4
1University of Alabama, 2University of Hawaii, 3Canada-France-Hawaii Telescope (CFHT)
Corp, 4Arizona State University

314.10 Understanding Polar Ring Galaxies Using the Cosinusoidal Potential
John P. Cumalat1, D.F. Bartlett1
1University of Colorado, Boulder
314.11 Changes in Mass, Density and Energy in Galaxy-Galaxy Interactions
Robert C. Berrington¹, S.D. Slavin²
¹Ball State University, ²Purdue University, Calumet

314.12 Kinematic Analysis of Nine Low Mass Gas-rich Galaxies
Daniel Wavle¹, L. van Zee¹, E.E. Richards¹, K.L. Barnes¹, S. Staudaher², D.A. Dale³,
D. Calzetti³, J. Dalcanton⁴, J. Bullock⁵, R. Chandar⁶, J.L. Hinz⁷
¹Indiana University, ²University of Wyoming, ³University of Massachusetts, ⁴University of Washington,
⁵University of California, ⁶University of Toledo, ⁷University of Arizona

314.13 The First Look at the Rest-Frame Optical Morphology of the Most UV-Luminous
Star-Forming Galaxies at High Redshift
Christian Wilson¹, K. Lee¹
¹Purdue University

314.14 Investigating the Dependence of the Rest-Frame Optical Morphology of High-
Redshift Star-Forming Galaxies on Stellar Masses
Gregory Neeser¹, K. Lee¹, S. Lorenz¹
¹Purdue University

314.15 On the Light Element Homogeneity of Terzan 7
Michael M. Briley¹, S.L. Martell², G.H. Smith³
¹Appalachian State University, ²UCO/Lick Observatory, ³Australian Astronomical
Observatory, Australia

314.16 Properties of the Ancient Stellar Populations in the Two Sculptor Group Dwarf
Satellite Galaxies : Revealed by RR Lyrae Variable Stars
Soung-Chul Yang⁴, R.A. Wagner-Kaiser⁵, A. Sarajedini⁶, S. Kim⁷, J. Kyeong⁸
⁴Korea Astronomy and Space Science Institute, Republic of Korea, ⁷University of Florida

314.17 New Herschel Multi-wavelength Extragalactic Survey of Edge-on Spirals
Benne Holwerda¹, S. Bianchi², J. Dalcanton³, D.J. Radburn-Smith⁴, R.S. de Jong⁵,
M. Baes⁶, P.C. van der Kruit⁷, K.D. Gordon³,⁴ M. Xilouris⁸, T. Boeker¹
¹European Space Agency, Netherlands, ²University of Washington, ³Space Telescope
Science Institute, ⁴University of Gent, Belgium, ⁵Greek National Observatory, Greece,
⁶Astronomisches Institut Potzdam (AIP), Germany, ⁷INAF, Italy, ⁸Kapteyn Institute,
Netherlands

314.18 On The Offset of Barred Galaxies From the Black Hole MBH-σ Relation
Jonathan Brown¹, M. Valluri², J. Shen², V.P. Debattista³, M. Hartmann¹,⁴
¹University of Michigan, ²Shanghai Astronomical Observatory, China, ³Jeremiah
Horrocks Institute, University of Central Lancashire, United Kingdom, ⁴Astronomisches
Rechen-Institut, Zentrum für Astronomieder Universität Heidelberg (ZAH), Germany

314.19 Dust Properties of Star Forming Galaxies at z~2
Matthew T. Nichols¹, J.L. Wojno¹, L. Haberzettl¹, G.M. Williger¹, M. Lenhert²,
N. Nesvadba³
¹University of Louisville, ²GEPI, Observatoire de Paris, France, ³Institut d’Astrophysique
Spatiale, Université Paris-Sud, France

314.20 Chandra Observational Constraints on the X-ray Mass-Temperature Relation of
Galaxy Clusters and Groups out to z~1.4
Jingying Wang¹, H. Xu¹
¹Shanghai Jiao Tong University, China

315.01 Measurement of the Rotation Rate of Jovian Planets with Doppler Spectroscopy
Piper Reid¹
¹Dripping Springs High School
315.02 Asteroid Rotation Studies
Xianming L. Han1, W. Liu1,4, L. Sun1,4, S. Gao1,4, J. Shi1,4, S. Wang1,4, X. Pan1,4, P. Jiang4, H. Zhou1,4, B. Li2, H. Zhao2
1Butler University, 2Purple Mountain Observatory, China, 3University of Science and Technology of China, China, 4Polar Research Institute of China, China

315.03 The Balloon Experimental Twin Telescope for Infrared Interferometry (BETTII): Progress Towards High Angular Resolution in the Far-Infrared
Stephen Rinehart1, R. Barclay1, R.K. Barry1, D.J. Benford1, D.J. Fixsen2, E. Gorman1, M. Jackson1, C. Jhabvala1, D. Leisawitz1, E. Mentzell1, L.G. Mundy2, M. Rizzo2, R.F. Silverberg1, J. Staguhn3, A. Willingham1, BETTII Team
1NASA’s GSFC, 2University of Maryland, 3Johns Hopkins University

315.04 GBT 3mm Observations in the ALMA-Era
David T. Frayer1, B.S. Mason1, R.J. Maddalena1
1NRAO

315.05 Precision Differential Photometry from a Non-Precision Site (Expanding Undergraduate Research Potential)
Joseph H. Jones1
1University of North Georgia

316 Instrumentation: Space Missions
Wednesday, 9:00 AM - 7:00 PM, Exhibit Hall D, Indiana Convention Center

316.01 Study of the Evolution of the ACS/WFC Sensitivity Loss
Leonardo Ubeda1, J. Anderson1
1Space Telescope Science Institute

316.02 Study of Evolution of the ACS/SBC Sensitivity
Roberto J. Avila1, ACS Team
1Space Telescope Science Institute

316.03 Surveying Resources for CTE-loss Mitigation in ACS/WFC
Josh Sokol1, M. Chiaberge1, ACS Team
1STScI

316.04 Flagging Bad Data in the COS FUV Detectors: Improving the Data Quality by Discarding Events
David J. Sahnow1, J. Ely1, P. Hodge1, S. Hernandez1
1Space Telescope Science Institute

316.05 Strategies for the Removal of Fixed-Pattern Noise in the COS FUV Detectors
Justin Ely1, D. Massa1, D.J. Sahnow1, S. Hernandez1
1STScI

316.06 Updated Status and Performance for the Cosmic Origins Spectrograph
Joanna M. Taylor1, A. Aloisi1, J. Bacinski1, K.A. Bostroem1, J.H. Debes1, J. Roman-Duval1, J. Ely1, A. DiFelice1, S. Hernandez2, G.A. Kriss1, P. Hodge1, K. Lindsay1, S.A. Lockwood1, D. Massa1, C.M. Oliveira1, R.A. Osten1, S.V. Penton1, C.R. Proffitt1, D.J. Sahnow1, P. Sonnentrucker1, T. Wheeler1
1Space Telescope Science Institute

316.07 Update on the Status of the Space Telescope Imaging Spectrograph onboard the Hubble Space Telescope
Svea Hernandez1, A. Aloisi1, K.A. Bostroem1, C. Cox1, J.H. Debes1, A. DiFelice1, J. Roman-Duval1, P. Hodge1, S. Holland1, K. Lindsay1, S.A. Lockwood1, E. Mason1, C.M. Oliveira1, S.V. Penton1, C.R. Proffitt1, P. Sonnentrucker1, J.M. Taylor1, T. Wheeler1
1STScI
### 316.08 WFC3 Calibration Pipeline Update: Significant Changes and Improvements

Megan L. Sosey¹, S.M. Baggett¹, B. Hilbert¹, WFC3 Team

¹STScI

### 316.09 Refined WFC3 Source Lists from the Hubble Legacy Archive (HLA)

Kevin Lindsay¹, M.A. Wolfe¹, S. Casertano¹, R.E. Anderson¹, R.L. White¹, L. Quick¹, A.M. Koekemoer¹

¹STScI

### 316.10 Simulating Wide-Field Slitless Spectroscopy with JWST/NIRISS

William V.D. Dixon¹, C.J. Willott⁴, R.G. Abraham⁴, M. Sawicki⁴, J.B. Hutchings², A.W. Fullerton¹

¹Space Telescope Science Institute, ²NRC Herzberg Institute of Astrophysics, Canada, ³Univ. of Toronto, Canada, ⁴Saint Mary's University, Canada

### 316.11 Wide Field Camera 3: Trends in the UVIS Detector

Matthew Bourque¹, J. Anderson¹, S.M. Baggett¹, J.A. Biretta¹, S.E. Deustua¹, D. Hammer¹, K. Noeske¹, J.W. MacKenty¹, WFC3 Team

¹STScI

### 316.12 Wide Field Camera 3: Phase II Proposal Update for Cycle 21

Heather C. Gunning¹, J. Anderson¹, S.M. Baggett¹, T. Dahlen¹, L.L. Dressel¹, K.S. Long¹, J.W. MacKenty¹, WFC3

¹Space Telescope Science Institute

### 316.13 The Large Observatory for X-ray Timing

Thomas J. Maccarone¹, LOFT Collaboration

¹Texas Tech University

### 316.14 Properties of the Hubble Source Catalog

Sahar S. Allam¹, T. Budavari², S. Casertano¹, S.H. Lubow¹, L. Quick¹, R.L. White¹, B.C. Whitmore¹

¹STScI, ²JHU

### 316.15 Herschel - delivering cool science for years to come

Stephan Ott¹

¹ESA, Netherlands

### 317 Stellar Evolution

Wednesday, 9:00 AM - 7:00 PM, Exhibit Hall D, Indiana Convention Center

#### 317.01 Any Density Changes Near the Inner Shell of the Planetary Nebula NGC 6803?

Seong-Jae Lee¹, S. Hyung¹

¹Chungbuk National University

#### 317.02 Long Period Monitoring of the Superoutbursts of Two SU UMa-type Dwarf Nova Stars: FO And and IR Gem

Aubrie A. Maxwell¹, R.K. Honeycutt¹

¹Indiana University

#### 317.03 Hubble Space Telescope Observations of the Light Echo from the Recent Outburst of T Pyxidis

Stephen S. Lawrence², J.L. Sokoloski¹, A.P.S. Crotts¹, H. Uthas¹

¹Columbia University, ²Hofstra University

#### 317.04 High Resolution Near-IR Imaging of VY Canis Majoris with LBT / LMIRCam (2 - 5 μm)

Dinesh Shenoy¹, T.J. Jones¹, R.M. Humphreys¹, LMIRCam Instrument Team (PI: Mike Skrutskie)

¹University of Minnesota
317.05 What is Changing in Eta Car?
Theodore R. Gull1, D.J. Hillier2, T. Madura1,4, M.F. Corcoran1,5, K. Hamaguchi1,6, M. Teodoro1,3
1NASA/GSFC, 2Univ of Pittsburgh, 3Science w/o Borders, Brazil, 4NASA Postdoctoral Program, 5USRA, 6UMBC

317.06 Photometric and Kinematic Analysis of ACS/HRC Ultraviolet Images of Eta Carinae
Drew Rosen1, J.A. Morse1
1Rensselaer Polytechnic Institute

317.07 Novel, Young, Low-Mass Multiples from the CASTOFFS Survey
Joshua E. Schlieder1, M. Bonnefoy1, N. Deacon1, T. Herbst1, K. Johnston1, S. Lepine2, J. Olofsson1, E.L. Rice1, J. Henning1
1Max Planck Institute for Astronomy, Germany, 2American Museum of Natural History

317.08 Light Element Abundance Inhomogeneities and Deep Mixing in Galactic Globular Clusters
Jeffrey Gerber1, M.M. Briley1, G.H. Smith2
1Appalachian State University, 2UCO/Lick Observatory

317.09 A Peculiar Class of Slow Speed Supernovae from the Palomar Transient Factory
Christopher J. White1, M.M. Kasliwal2, Palomar Transient Factory
1Princeton University, 2Carnegie Observatories

317.10 Signatures of Electron Capture and High Magnetic Fields in Late-Time NIR Spectra of SN 2005df
Christopher L. Gerardy1, T. Diamond1, P. Hoeflich1
1Florida State Univ

317.11 Convergence Studies of Protostellar Disks with Gravitational Instabilities
Thomas Y. Steiman-Cameron1, C.R. McConnell1, R.H. Durisen1, A.C. Boley2
1Indiana Univ, 2University of Florida

317.12 Swift Ultraviolet Survey of the Magellanic Clouds
Stefan Immler1, M. Siegel2
1NASA/GSFC, 2Penn State

318 Galaxy Observations
Wednesday, 9:00 AM - 7:00 PM, Exhibit Hall D, Indiana Convention Center

318.01 Continuing L-Band Observations of Blazars with the 21-Meter Space Tracking Antenna at Morehead State University
William P. Moffitt1, A. Lackey-Stewart1, T. Pannuti1
1Morehead State University

318.02 X-ray Observations of NGC 1068 using Suzaku
Aaron T. Steffen1
1UW - Marathon County

318.03 Radio and Optical Polarimetry of M87 between 2003-2008
Sayali S. Avachat1, E.S. Perlman1, F.N. Owen2, S.C. Adams3,4, M. Cara1,5
1Florida Institute of Technology, 2National Radio Astronomy Observatory, 3Department of Physics and Astronomy, 4Department of Physics and Astronomy, 5Physics Department, Case Western Reserve University

318.04 Determining the Radial Locations of Dust Sources in FeLoBALs
Jay P. Dunn1, Branden Wasik, Christin L. Holtzclaw, David Yenerall, Manuel Bautista, Nahum Arav, Daniel Hayes, Max Moe, Luis Ho
1Georgia Perimeter College
318.05  Centaurus A @ ALMA+ATCA: Molecular Gas toward the AGN of the nearest radio galaxy
Juergen Ott\textsuperscript{1}, D.S. Meier\textsuperscript{2,1}, M. McCoy\textsuperscript{2}, CenA team
\textsuperscript{1}National Radio Astronomy Observatory, \textsuperscript{2}New Mexico Institute for Technology

318.06  Simulation and Separation for Signals in Low-Frequency Radio Sky
Haiguang Xu\textsuperscript{1}, J. Wang\textsuperscript{1}
\textsuperscript{1}Shanghai Jiao Tong University, China
Thursday Sessions and Events

Thursday

400 Current Perspectives on the Spiral Structure of the Milky Way
Thursday, 8:30 AM - 9:20 AM, Wabash Ballroom 1, Indiana Convention Center

Chair
Ed Churchwell
University of Wisconsin

400.01 Current Perspectives on the Spiral Structure of the Milky Way
Thomas M. Dame
Harvard-Smithsonian CfA

401 Bridging Laboratory and Astrophysics: Particles
Thursday, 10:00 AM - 11:30 AM, Room 117, Indiana Convention Center

Laboratory astrophysics is the Rosetta Stone that enables astronomers to understand and interpret the cosmos. This session will focus on the interplay between astrophysics with theoretical and experimental studies into the underlying particle physics processes which drive our Universe.

Chair
Daniel W. Savin
Columbia Astrophysics Lab

401.01 IceCube and Indirect Dark Matter Searches
Carsten Rott
Ohio State University, Sungkyunkwan University, Republic of Korea

401.02 GALPROP Code for Galactic Cosmic Ray Propagation and Associated Photon Emissions
Igor Moskalenko, GALPROP Team
Stanford University

402 Instrumentation, Data Handling, Surveys
Thursday, 10:00 AM - 11:30 AM, Wabash Balloom 3, Indiana Convention Center

Chair
Ralf C. Kotulla
University of Wisconsin - Milwaukee

402.01 The WISE Survey of the Near-Earth Asteroids (NEOWISE)
Planetary Science Institute, Jet Propulsion Laboratory, Infrared Processing and Analysis Center, California Institute of Technology, Lunar and Planetary Laboratory, University of Arizona, Minor Planet Center, Harvard-Smithsonian Center for Astrophysics, UCLA Astronomy, Monterey Institute for Research in Astronomy

402.02 The PS1 Science Mission - Status and Results
Kenneth C. Chambers
Univ. of Hawaii

402.03D A New Era of Observational Capability at Ritter Observatory: Spectropolarimetry from Exoplanets to Circumstellar Disks and Beyond
James W. Davidson, K.S. Bjorkman
The University of Toledo
402.04  Vacuum-Ultraviolet Spectroscopy of H2O- and N2-Dominated Solids at Low Temperature  
Perry A. Gerakines¹, A. Hendrix²  
¹NASA GSFC, ²Planetary Science Institute

402.05  Optimization of Micro-Spec, an Ultra-Compact High-Performance Spectrometer for Far-Infrared Astronomy  
Giuseppe Cataldo¹,² S.H. Moseley¹, E. Wollack¹, W. Hsieh¹, W. Huang¹, T. Stevenson¹  
¹NASA Goddard Space Flight Center, ²Universities Space Research Association (USRA)

402.06  Prototype Development of the GMT Fast Steering Mirror  
Young-Soo Kim¹, J. Koh¹, H. Jung¹, H. Jung¹, M.K. Cho², W. Park¹, H. Yang¹, H. Kim⁵, K. Lee¹, H. Ahn⁶, B. Park¹  
¹NOAO, ²The University of Arizona, ³KRISS, Republic of Korea, ⁴IAE, Republic of Korea, ⁵GIST, Republic of Korea

402.07  An Efficient and Optimal Technique for Identifying Point Sources in Millimeter/sub-millimeter Sky Maps  
Thushara Perera¹, G. Wilson², K.S. Scott³, J. Austermann⁴, A. Mancera¹  
¹Illinois Wesleyan University, ²University of Massachusetts Amherst, ³National Radio Astronomy Observatory, ⁴University of Colorado Boulder

403 Stellar Evolution and Binary Stars
Thursday, 10:00 AM - 11:30 AM, Wabash Ballroom 1, Indiana Convention Center

Chair
Paul A. Mason¹  
¹Univ. Of Texas at El Paso

403.01  Stellar Collisions and Blue Straggler Stars in Dense Globular Clusters  
Sourav Chatterjee¹, F.A. Rasio¹, A. Sills¹, E. Glebbeek¹  
¹University of Florida

403.02  Occultation of the T Tauri Star RW Aurigae A by its Tidally Disrupted Disk  
Joseph E. Rodriguez¹,² J. Pepper¹,² K. Stassun², R. Siverd², P. Cargile², T.G. Beatty⁴, B.S. Gaudi⁵, KELT Team  
¹Fisk University, ²Vanderbilt University, ³Lehigh University, ⁴Ohio State University

403.03  Search for TeV Gamma Rays from Cygnus X-3  
Wei Cui¹, VERITAS Collaboration  
¹Purdue Univ.

403.04  The Brightest X-ray Point Sources in M82  
Floyd Jackson¹,² T.P. Roberts³, A. Zezas³,⁴ R.E. Kilgard⁵  
¹University of Toledo, ²Durham University, United Kingdom, ³Harvard-Smithsonian Center for Astrophysics, ⁴University of Crete, Greece, ⁵Van Vleck Observatory, Wesleyan University

403.05  Neutron-capture Nucleosynthesis in the First Stars  
Ian U. Roederer¹  
¹Carnegie Observatories
404 The Bridged Gap: Transients in the Local Universe
Thursday, 11:40 AM - 12:30 PM, Wabash Ballroom 1, Indiana Convention Center

Chair
Paula Szkody¹
¹University of Washington

404.01 The Bridged Gap: Transients in the Local Universe
Mansi M. Kasliwal¹,², Palomar Transient Factory
¹Carnegie Institution for Science, ²Princeton University
Abbas, Mian M. 202.04
Aboobaker, Asad M. 119.07
Abraham, Roberto G. 316.10
Adams, Elizabeth A. 214.16
Adams, Steven C. 318.03
Ade, Peter 119.07
Ade, Peter A. R. 110.04D
Ahn, Hyo-Sung 402.06
Ahumada, Andrea V. 310.06
Airapetian, Vladimir 116.14
Akeson, Rachel L. 115.03
Allam, Sahar S. 316.14
Allen, Glenn E. 118.10
Allen, Lori 310.01
Aller, Hugh D. 215.02
Aller, Margo F. 215.02
Aloisi, Alessandra 316.06, 316.07
Amaya, Hector 216.10
Anderson, Jay 116.05, 117.08, 316.01, 316.11, 316.12
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Anderson, Matthew 209.06
Anderson, Rachel E. 316.09
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Andersson, Karl 309.03D
Anella, Ryan 218.02
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Angil Francesco E. 110.04D
Araya, Esteban 216.07
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Aubin, Francois 119.07
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Avila, Roberto J. 316.02
Avril, Ryan L. 217.18, 302.03
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Baldwin, Jack A. 216.02
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Balsara, Dinshaw S. 110.02D
Balser, Dana S. 211.03
Bandura, Kevin 119.07
Bania, Thomas M. 211.03
Bao, Chaoyun 119.07
Barclay, Richard 315.03
Barger, Amy J. 105.06
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Barnes, Kate L. 314.04, 314.12
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Bartlett, David F. 119.05, 314.10
Bartolone, Lindsay 108.05, 120.01
Basri, Gibor S. 304.04
Bastien, Fabienne A. 304.04
Bauer, James M. 402.01
Bautista, Manuel 114.01, 114.02
Beasley, Anthony J. 205.01
Beatty, Thomas G. 302.03, 403.02
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Beichman, Charles A. 217.06
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Benford, Dominic J. 315.03
Benjamin, Robert A. 303.03, 313.01, 313.03, 313.04, 313.05, 313.07, 313.09, 313.11
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Benton, Steven J. 110.04D
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Bhatta, Gopal 215.03
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Biennier, Ludovic 114.10
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Biretta, John A. 316.11
Bischoff, Addi 114.11
Biswas, Rahul 118.01
Bjorkman, Karen S. 116.16, 402.03D
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Blakeslee, John P. 116.12
Bochanski, John J. 116.17
Boeker, Torsten 314.17
Boettcher, Markus 309.05
Bolatto, Alberto D. 216.03
Boley, Aaron C. 317.11
Bonanos, Alceste Z. 103.05
Bond, Howard E. 116.05
Bondarenko, Anton 102.03, 210.03
Bonnefoy, Micka 317.07
Borissova, Jura 117.04
Boswell, Josiah S. 114.02
Bourque, Matthew 316.11
Boyer, Nathan E. 116.12
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Brickhouse, Nancy S. 310.04
Bridges, Terry J. 214.10
Briley, Michael M. 314.15, 317.08
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Brown, Jonathan 314.18
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Brunner, Robert J. 119.01, 119.02
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Bryson, Kathryn 114.11
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Bullock, James 314.04, 314.12
Bunn, Emory F. 103.04D
Burgasser, Adam J. 116.06
Burks, Geoffrey S. 120.14
Burrows, Andrea C. 120.16
Bushouse, Howard A. 310.05
Bustamante, Sebastian 302.05
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Buzasi, Derek L. 217.02
Calkins, Michael L. 302.03
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Cannon, John M. 214.16, 314.07
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Carey, Sean J. 313.06
Cargile, Phillip 302.03, 403.02
Carini, Michael T. 215.04
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Carolyn, Nugent 402.01
Carpenter, Kenneth G. 116.14
Carrasco Kind, Matias 119.01
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Cegla, Heather M. 304.02D
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Chambers, Kenneth C. 402.02
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Chapman, Nicholas L. 110.04D
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Chatterjee, Sourav 403.01
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Cho, Hojin 309.04
Cho, Myung K. 402.06
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Clark, Joni 217.03, 302.05
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Coble, Kimberly A. 120.12
Cohn, Haldan N. 117.08
Cole, Kevin 120.06
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Constantin, Carmen 102.03, 210.03
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Cooke, Jeff 208.07
Cool, Adrienne 117.08
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Corcoran, Michael F. 317.05
Cordero, Maria J. 214.09
Cotera, Angela 310.03
Couch, Sean M. 209.01
Coughlin, Jared 119.03
Couturier-Tamburelli, Isabelle 109.04
Cox, Colin 316.07
Craig, Darren 114.14
Craine, Eric R. 120.11
Cranmer, Steven R. 310.04
Crawford, Fronefield 218.02
Crepp, Justin R. 302.03
Crocker, Alison F. 208.02
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Cruz, Kelle L. 116.06
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Dalhed, Hollis E. 209.02
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Darragh, Andrew N. 115.12
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Dave, Romeel 119.09
Davidson, James W. 402.03D
Davidson, Kris 116.08
Davies, Richard 309.01
Dawson, Kyle S. 118.03, 215.05
Day, Amanda N. 116.15
Day, Sarah 114.16
de Jong, Roelof S. 314.17
de Oliveira, Nelson 114.09
de Ruette, Nathalie 114.08
De Vries, Christopher H. 216.07
Deacon, Niall 317.07
Deal, Shanel 120.11
Debattista, Victor P. 314.18
Debes, John H. 316.06, 316.07
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