## 2019 50th Annual DDA Meeting Schedule

## 2019 50th Annual Meeting of the DDA

## Oral Presentations

All oral presentation sessions are located in the Mathematics Building on the campus of the University of Colorado, Boulder

| Sunday, June 9 |  |  |  |
| :---: | :---: | :---: | :---: |
| 4:00 | DDA Committee Meeting at UMC 425 |  |  |
| Opening Reception Koening Alumni Center5:00-8:00 |  |  |  |
| 5:00 | Registration opens at Koening Alumni Center; food and drink available at start |  |  |
| Monday, June 10 |  |  |  |
| 7:50 | Carl Murray, Jay McMahon, Seth Jacobson | SOC, LOC, and DDA chairs | Introduction and announcements |
| MATH100 <br> Dynamics of Asteroids Chair: Marina Brozovic 8:00-10:00 |  |  |  |
|  |  |  |  |
| 8:00 | Timothy Holt | University of Southern Queensland | Simulations of a Synthetic Eurybates Collisional Family |
| 8:15 | Alex Davis | University of Colorado, Boulder | High-Fidelity Testing of <br> Binary Asteroid <br> Formation with <br> Applications to 1999 <br> KW4 |
| 8:30 | Daniel Brack | University of Colorado, Boulder | The Dynamical Surface Environment of Tumbling Asteroids |
| 8:45 | Daniel Scheeres | University of Colorado, Boulder | Disassociation Energies for Rubble Pile Asteroids |
| 9:00 | Jay McMahon | University of Colorado, Boulder | The Dynamics of Surface Launched Particles around Bennu |
| 9:15 | Apostolos Christou | Armagh Observatory and Planetarium | Earth's missing Trojans: Lessons from Mars and the role of radiation forces |
| 9:30 | Flaviane Venditti | Arecibo Observatory | Radar Astrometry of Near-Earth Asteroids from the Arecibo Observatory: 2018-2019 |
| 9:45 | Darryl Seligman | Yale University | On the Anomalous <br> Acceleration of $11 / 2017$ <br> U1 `Oumuamua |

## Morning Coffee Break

10:00-10:30

## MATH100

Formation, Dynamical Evolution, and Detection of Circumbinary Planets

## Chair: Billy Quarles

10:30-12:00

| 10:30 | Rebecca Martin | University of Nevada, Las Vegas | Circumbinary disks: Planet formation in a dynamically complex environment (Invited) |
| :---: | :---: | :---: | :---: |
| 11:00 | Alessia Franchini | University of Nevada, Las Vegas | Multi-planet disc interactions in binary systems |
| 11:15 | Veselin Kostov | NASA Goddard | Using orbital dynamics to detect circumbinary planets: A novel approach (Invited) |
| 11:45 | Nader Haghighipour | University of Hawaii | Planet migration in circumbinary disks and the boundary of stability |

unch Break
12:00-1:30

## MATH100

Dynamics of Satellites
Chair: Kat Volk
1:30-3:00

| 1:30 | Robert Jacobson | Jet Propulsion Laboratory | The Gravity Field of the Saturnian System and the Orbits of Saturn's Satellites |
| :---: | :---: | :---: | :---: |
| 1:45 | Thomas Rimlinger | University of MD, College Park | And Then There Was One |
| 2:00 | Marc Neveu | University of Maryland | Evolution of Saturn's mid-sized moons |
| 2:15 | Maryame El Moutamid | Cornell University | The Orbital Connection between Mimas and Enceladus |
| 2:30 | Matija Cuk | SETI Institute | Dynamical History of the Uranian Satellites |
| 2:45 | Marina Brozovic | Jet Propulsion Laboratory/California Institute of Technology | Orbits and resonances of the regular moons of Neptune |
| Afternoon Coffee Break$3: 00-3: 30$ |  |  |  |
| Dirk Brouwer Award Prize Lecture Chair: Seth Jacobson$3: 30-4: 15$ |  |  |  |
|  |  |  |  |
| 3:30 | James Stone | Princeton University | Numerical Methods for Astrophysical Fluid Dynamics |
| Vera Rubin Early Career Prize Lecture <br> Chair: Seth Jacobson |  |  |  |

## 4:15-5:00

4:15 Gurtina Besla University of Arizona The LMC vs. the Milky

## Conference Banquet

Fiske Planetarium
6:00-9:00

| 6:00 | Drink available at start |
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| $7: 00$ | Dinner served |
| 8:00 | Planetarium show (hour long) |

Tuesday, June 11
7:50
MATH100

In Honor of the Contributions of Andrea Milani Chairs: Steven Chesley and Federica Spoto 8:00-10:00

| 8:00 | William Bottke | Southwest Research Institute | The Dynamical Evolution of Asteroid Families (Invited) |
| :---: | :---: | :---: | :---: |
| 8:25 | Federica Spoto | Observatoire de la Cote d'Azur | New advances on chaotic orbit determination |
| 8:40 | Giovanni Valsecchi | IAPS-INAF | Planetary close encounters: an analytical approach (Invited) |
| 9:05 | Davide Farnocchia | Jet Propulsion Laboratory, California Institute of Technology | The tale of three small impacting asteroids (Invited) |
| 9:30 | Daniele Serra | University of Pisa | Orbit determination for space missions in Pisa: results and simulations from Juno and BepiColombo |
| 9:45 | Steven Chesley | Jet Propulsion Laboratory, California Institute of Technology | Trajectory estimation for Bennu's particles |
| Morning Coffee Break10:00-10:30 |  |  |  |
| MATH100 |  |  |  |
| Dynamics of the Outer Solar System Chair: Davide Farnocchia10:30-12:00 |  |  |  |
| 10:30 | Luke Dones | Southwest Research Institute | Origin and Evolution of Long-Period Comets |
| 10:45 | William Oldroyd | Northern Arizona University | Computationally and Observationally Constraining the Outer Solar System Perihelion Gap to Help Find Planet X |
| 11:00 | Alexander Zderic | University of Colorado, Boulder | Resilience of the Self-Gravity Instability |

$11: 15$
$11: 30$
11:45
Lunch Break
12:00-1:30

## MATH100

Dynamics of Stars
Chair: Julie Comerford
1:30-3:30
$\left.\begin{array}{lll}\text { 1:30 } & \text { Hayden Foote } & \begin{array}{l}\text { University of Colorado, } \\ \text { Boulder }\end{array} \\ \text { 1:45 } & \text { Alexander Stephan } & \begin{array}{l}\text { Vertical Mass } \\ \text { Segregation in }\end{array} \\ \text { 2:00 } & & \begin{array}{l}\text { University of California, } \\ \text { Los Angeles }\end{array} \\ \text { Eccentric Nuclear Disks } \\ \text { The Fate of Binaries in }\end{array}\right\}$

| 4:15 | Curtis Struck | Iowa State University | Hot and Cold <br> Exponential Galaxy Disks from Star and Gas Scattering |
| :---: | :---: | :---: | :---: |
| 4:30 | Julie Comerford | University of Colorado, Boulder | Using Kinematics to Discover an AGN Turning Off and On |
| 4:45 | Rebecca Nevin | University of Colorado, Boulder | Accurate Identification of Galaxy Mergers with Imaging and Kinematics |
| DDA Annual Members' Meeting <br> MATH100 <br> 5:00-6:00 |  |  |  |
| Public Talk <br> Upslope Brewery <br> 1898 S Flatiron Ct, Boulder, CO 80301 <br> 7:00-9:00 |  |  |  |
|  |  |  |  |
|  |  |  |  |
| 7:00 | Alyssa Rhoden | Southwest Research Institute | Exploring Ocean Worlds |
| Wednesday, June 12 |  |  |  |
| 7:50 | Carl Murray, Jay McMahon, Seth Jacobson | SOC, LOC, and DDA chairs | Introduction and announcements |

## Dynamics of Rings

Chair: Maryame El Moutamid
8:00-9:45

| 8:00 | Joseph A'Hearn | University of Idaho | Are moonlets hidden among the clumps in Saturn's innermost ring? |
| :---: | :---: | :---: | :---: |
| 8:15 | Philip Nicholson | Cornell University | The shape of Saturn's outer B ring |
| 8:30 | Rebecca Harbison | University of Nebraska, Lincoln | Changes in Saturnian Ring Particle-Size Distribution after Satellite Passage |
| 8:45 | Douglas Hamilton | University of Maryland | Stability of One Dimensional Rings of Gravitationally Interacting Masses |
| 9:00 | Yuxi Lu | University of Maryland | Simulating Saturn's A ring edge with a single chain of gravitationally-i nteracting particles |
| 9:15 | Glen Stewart | University of Colorado | A Variational Principle for Self-Gravity Wakes and Spiral Density Waves |
| 9:30 | Bruno Sicardy | Sorbonne Universit $\sqrt{\text { © }}$ and Paris Observatory | Rings around irregular bodies: a rich zoo of resonances |

## MATH100

Dynamics of lunar probes
Chair: Maryame El Moutamid
9:45-10:00

## Morning Coffee Break

10:00-10:30

## MATH100

Dynamics of Planetary Systems
Chair: Sarah Millholland
10:30-12:00
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\begin{array}{lll}\text { 10:30 } & \text { Matt Clement } & \text { Oklahoma University }\end{array}
$$ \begin{array}{l}The Early Instability <br>

Scenario for Planet\end{array}\right\}\)| Formation in the Solar |
| :--- |
| System |

## MATH100

Dynamics of Exoplanets
Chair: Christopher Spalding
1:30-3:30

| 1:30 | Sarah Millholland | Yale University | Excitation of Planetary Obliquities Through |
| :---: | :---: | :---: | :---: |
| 1.45 | Billy Quarles | Georgia Institute of | Planet-Disk Interactions |
|  | Bily Quarles | Technology | Earthlike planets in $\alpha$ Centauri AB |
| 2:00 | Darin Ragozzine | Brigham Young | Modeling the |
|  |  | University | Architectures of |
|  |  |  | Exoplanetary Systems using Clusters of Similar Planets |
| 2:15 | Fred Adams | University of Michigan | Dynamical Constraints on Planetary Systems: |
|  |  |  | Multi-Planet Systems |
|  |  |  | Observed with Single |
|  |  |  | Transits |
| 2:30 | Jesus Salas | UCLA | Unseen companions of |
|  |  |  | $\checkmark$ Hya inferred from periodic ejections |
| 2:45 | Bonan Pu | Cornell University | Low-Eccentricity |


| 3:00 | Elizabeth Bailey | California Institute of Technology | Formation of Ultra-Short Period Planets in Multi-Planet Systems The hot Jupiter period-mass distribution as a signature of in situ formation |
| :---: | :---: | :---: | :---: |
| Afternoon Coffee Break3:15-4:00 |  |  |  |
| MATH100 <br> Dynamics of Exoplanets (continued) <br> Chair: Christopher Spalding 4:00-4:30 |  |  |  |
| 4:00 | Marialis Rosario-Franco | National Radio Astronomy Observatory | Determining Stability Conditions for Submoons Orbiting Exomoon Candidate: Kepler 1625 -b-I |
| MATH100 <br> Dynamics of the $N(>=3)$-Body Problem <br> Chair: Apostolos Christou $4: 15-5: 15$ |  |  |  |
| 4:15 | Mauri Valtonen | University of Turku | Three-body stability limit at infinite time |
| 4:30 | Rodney Anderson | Jet Propulsion Laboratory, California Institute of Technology | Spatial Low-Energy Asteroid and Comet Transit Analysis |
| 4:45 | Daniel Tamayo | Princeton University | Operator splitting methods for numerical integration of weakly perturbed N -body systems |
| 5:00 | David Hernandez | RIKEN | Should N -body integrators be (fully) symplectic? |
| Unoffical Pub Night <br> Bohemian Biergarten <br> 2017 13th St, Boulder, CO 80302 <br> 8:00-10:00 |  |  |  |
|  |  |  |  |
|  |  |  |  |
| 8:00 | Merriment |  |  |
| Thursday, June 13 |  |  |  |
| 7:45 | Carl Murray, Jay McMahon, Seth Jacobson | SOC, LOC, and DDA chairs | Introduction and announcements |
| MATH100 <br> In Honor of the Contributions of Bill Ward Chair: Alan Harris $7: 50-10: 00$ |  |  |  |
| 7:50 | Alan Harris | More Data! Inc. | Introduction |
| 7:55 | Andrew Youdin | University of Arizona | The Formation of Planetesimals (Invited) |
| 8:20 | Robin Canup | Southwest Research Institute | The Evection Resonance in the |


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| :--- | :--- | :--- |
| 8:35 |  | Earth-Moon system: <br> Analytical analysis |
| 8:50 | Raluca Rufu | Southwest Research <br> Institute |
|  |  | The Evection <br> Resonance in the <br> Earth-Moon system: |
|  | John Papaloizou | University of Cambridge |
| Numerical analysis |  |  |

## Poster Presentations

All poster presentation sessions are located in the Mathematics Building on the campus of the

University of Colorado, Boulder

## Available all week

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Leland Langston
Thomas Chamberlain
Aaron Rosengren
David Bartlett Jian Wu Travis Yeager Richard French Carlisle Wishard Robert Chancia


Margrethe Wold
David Fleming
Jorge Perez-Hernandez
Hareesh Gautham
Bhaskar
Joseph Hahn
Abigail Graham

| L2 Consulting | A New Non-Recursive Approach for Calculating Satellite Orbital Positions |
| :---: | :---: |
| University of California, Berkeley | Derivation of Cosmic |
|  | Acceleration Given |
|  | Inward Unbounded |
|  | Light-Speed in the |
|  | Hubble Expansion |
| University of Arizona | Geocentric Proper |
|  | Orbital Elements |
| University of Colorado, | Cosinusoidal Potential |
| Boulder | as a Possible Solution to the Planet IX Problem |
| Iowa State University | Formation of |
|  | Exponential Profiles from Stellar Scattering |
|  | Investigated with |
|  | N -body Simulations |
| Iowa State University | Simulations of |
|  | Multi-component Splash |
|  | Bridges in Direct Galaxy |
|  | Collisions |
| Wellesley College | High-resolution profiles of the Uranian rings |
|  | from Voyager 2 radio |
|  | occultation observations |
| Purdue University | Collisional |
|  | fragmentation as a |
|  | source for early martian impactors |
| University of Idaho | Re-examining the rings of Uranus in the |
|  | Voyager 2 images |
| University of Colorado | Vertical Mass |
| Boulder | Segregation in |
|  | Eccentric Nuclear Disks |
| Universtity of Agder | The planar rigid two-body problem |
| University of | VPLanet: The Virtual |
| Washington | Planet Simulator |
| ICF-UNAM | Effect of the Yarkovsky |
|  | transverse parameter |
|  | on radar astrometry for asteroid (99942) |
|  | Apophis |
| Georgia Institute of | Non-hierarchical Triple |
| Technology | Dynamics and |
|  | Applications to Planet |
|  | Nine |
| Space Science Institute | Nbody Simulations of |
|  | Self Confining Ringlets |
| Brigham Young | Identifying Three-body |
| University | Resonances in Kepler's |
|  | Extrasolar Planetary |
|  | Systems |


| 17 | Vatsala Sharma | Brigham Young University | Towards a <br> Photodynamical <br> Analysis of Kepler's <br> Multiply-Transiting Systems |
| :---: | :---: | :---: | :---: |
| 18 | Sierra Ferguson | Arizona State University | Size frequency distributions of impact craters on Saturn's moons Tethys \& Dione; implications for source impactors |
| 19 | Daniel Hestroffer | IMCCE, Paris | Comparison of predictions of asteroids' close encounters with the Earth |
| 20 | Ziqian Hong | Georgia Institute of Technology | Could there be an undetected inner planet near the stability limit in Kepler-1647? |
| 21 | Michael Cahill | University of Wisconsin <br> - Milwaukee | The Exact Boltzmann Most Probable Monatomic Ideal Gas |
| 22 | Colleen McGhee-French | Wellesley College | Planned archive of Uranus ring occultation observations on NASA's Planetary Data System |

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