2022 53rd Annual DDA Meeting Schedule

2022 53rd Annual Meeting of the DDA

Flatiron Institute, Manhattan NY

Oral Presentations

All times are local time (EDT, UTC-4)

Monday, April 25th

Introduction and Announcements
Dan Tamayo, Kathryn Johnston, Ruth Murray-Clay
SOC, LOC and DDA Chairs
8:00 - 8:10

Disequilibrium in the Galactic Disk
Chair: Frank van den Bosch
Slack Chair: Thomas Donlon
8:00 - 9:00

8:10	Jason Hunt	Flatiron Institute	A Milky Way in motion: Dealing with dynamical disequilibria
8:20	Uddipan Banik	Yale University	Phase-space spirals as probes of perturbed, out-of-equilibrium disk galaxies
8:30	Christopher Carr	Columbia University	Stellar Migration in the Milky Way's Disc from Encounters with the Sagittarius Dwarf Galaxy (virtual)
8:40	Lekshmi Thulasidharan	University of Wisconsin	Evidence of a vertical kinematic oscillation beyond the Radcliffe Wave
8:50	Peter Craig	Rochester Institute of Technology	Building an Acceleration Ladder with Tidal Streams and Pulsar Timing

Star Clusters
Chair: Zephyr Penoyre
Slack Chair: Mor Rozner
9:00-9:30

9:00	Lu Li	Shanghai Astronomical Observatory	Modeling open clusters in the CMD: binaries, mass function, and dynamical

			evolution (virtual)
9:10	Anna Parul	University of Alabama	Flowing at Birth: A Dynamical Investigation of the Young Pisces-Eridanus Stream
9:20	Vaclav Pavlik	Indiana University	Effects of radially anisotropic velocity distribution on the dynamics of star clusters

Dynamics Beyond the Main Sequence
Chair: Mor Rozner
Slack Chair: Michelle Vick
9:30-10:00

9:30	Christopher O'Connor	Cornell University	The comet bombardment rate of solitary white dwarfs
9:40	Catriona McDonald	University of Warwick	Binary asteroid scattering around white dwarfs
9:50	Samuel Grunblatt	American Museum of Natural History, Flatiron Institute	Probing planetary architecture evolution with post-main sequence planets

Morning Coffee Break
10:00 - 10:30

Planetary Transactions of Angular Momentum
Chair: Jiayin Dong
Slack Chair: Sarah Millholland
10:30-11:30

10:30	Juliette Becker	Caltech	Producing Moderate Stellar Obliquity through Planet Formation in Broken, Misaligned Protoplanetary Disks
10:40	Malena Rice	Yale University	Origins of Hot and Warm Jupiters from the Stellar Obliquity Distribution (2020 Duncombe)
10:50	Andrew Langford	Notre Dame University	A Dynamical Systems Theory Approach to Circumbinary Orbital Dynamics (virtual)
11:00	Chen Chen	Georgia Institute of Technology	Mutual Inclination of

			Ultra-Short-Period Planets with Time Varying Stellar J2-moment (virtual)
11:10	Nathaniel Moore	Georgia Institute of Technology	Formation History of HD106906 and the Vertical Warping of Debris Disks by an External Inclined Planetary Companion
11:20	Laetitia Rodet	Cornell University	The impact of stellar clustering on the observed multiplicity of super-Earth systems: outside-in cascade of orbital misalignments initiated by stellar flybys
11:30	Santiago Torres	University of California, Los Angeles	Raining Rocks: Collision, capture and ejection rates of comets in planetary systems

Tides
Chair: Matija Cuk
Slack Chair: Kat Volk
11:40-12:00

11:40	Robert Jacobson	Jet Propulsion Laboratory	Tidal Dissipation in the Saturnian System
11:50	Janosz Dewberry	Caltech, Canadian Institute for Theoretical Astrophysics	Dynamical Tidal Love Numbers of Rapidly Rotating Planets and Stars

Binary Stars
Chair: Maddie Lucey
Slack Chair: Laetitia Rodet
1:00-1:30

1:00	Zephyr Penoyre	Columbia University	The Astrometric Contribution of Unresolved Stellar Companions in Gaia
1:10	Hsiang-Chih Hwang	Institute for Advanced Study	Eccentricity of wide binary stars
1:20	Chris Hamilton	Institute for Advanced Study	The eccentricity distribution of wide binaries in the Galaxy

Advances in Theory and Numerics for Galactic Dynamics
Chair: Robyn Sanderson

Slack Chair: Farnik Nikakhtar
1:30-2:20

1:30	Tomer Yavetz	Columbia University	Observing Fundamental Dynamics in the Milky Way: Stream Morphologies, Separatrices, and Dark Matter Potentials
1:40	Frank van den Bosch	Yale University	Dynamical Friction, Core Stalling & Dynamical Buoyancy
1:50	Martin Weinberg	University of Massachussetts, Amherst	A new instability in dark-matter halos
2:00	Alexander Johnson	Columbia University	Coupling Basis Function Expansion with Multi-Channel Singular Spectrum Analysis: a Powerful Toolkit for Dynamical Systems.
2:10	Leandro Beraldo e Silva	University of Michigan	Collisionless gravitational systems: discrete or not discrete? - That's the question

Poster pops
Chair: Dan Tamayo
2:20 - 2:30

Afternoon Coffee Break
2:30 - 3:00

Special Session: Modern Theories of Planetesimal Formation
Chair: Seth Jacobson
Slack Chair: Matthew Hedman
3:00-4:30

3:00	Rixin Li	Cornell University	Thresholds for Planetesimal Formation by the Streaming Instability
3:12	Chao-Chin Yang	University of Nevada, Las Vegas	The Streaming Instability with Multiple Dust Species in Protoplanetary Disks
3:24	Jacob Simon	Iowa State	The Formation of

		University	Planetesimals by the Streaming Instability
3:36	Wesley Fraser	Herzberg Institute of Astrophysics	Pebble Cloud Collapse, a Revolution in Planetesimal Formation (virtual)
3:48	Michele Bannister	University of Canterbury	Interstellar planetesimals as diagnostics of galactic star-formation history (virtual)
4:00	Jackson Barnes	Michigan State University	The Role of Particle Contact Physics in Planetesimal Formation
4:10	Cristiano Longarini	Università Degli Studi di Milano	The dynamical role of drag force in gravitational instability: a path to form planetary cores in young protostellar discs
4:20	Natascha Manger	Flatiron Institute	Suppression of collision velocities in particle-laden protoplanetary disk turbulence

DDA Initiatives Recap and Discussion
Juliette Becker & Dan Tamayo
4:30 - 5:00

Welcome Reception
5:00-6:00

Tuesday, April 26th

Introduction and Announcements
Dan Tamayo, Kathryn Johnston, Ruth Murray-Clay
SOC, LOC and DDA Chairs
8:00 - 8:10

Binary Asteroids and Radiation Forces
Chair: Rogerio Deienno
Slack Chair: Rixin Li
8:10 - 9:00

8:10	Jorge Perez-Hernandez	Telespazio Germany GmbH	Non-zero Yarkovsky acceleration for near-Earth asteroid (99942) Apophis (2020 Duncombe)
8:20	Matija Cuk	SETI Institute	Near-Critical Rotation of Binary Asteroid Primaries

8:30	Alex Meyer	University of Colorado, Boulder	Modeling the Chaotic Dynamics of Binary Asteroid 1991 VH
8:40	Ryota Nakano	Auburn University	A new binary-YORP effect model combining full two rigid body dynamics and three-dimensional thermal evolution
8:50	Harrison Agrusa	University of Maryland	Predictions for the Dynamical State of the Didymos Binary System Before and After the DART Impact

Cosmological footprints in Local Group dynamics
Chair: Farnik Nikakhtar
Slack Chair: Juan Guerra
9:00 - 10:00

9:00	Scott Lucchini	University of Wisconsin	The Magellanic Stream at 20 kpc: A New Orbital History for the Magellanic Clouds (2022 Duncombe)
9:10	Katie Chamberlain	University of Arizona	Implications of the travel velocity of the Milky Way on Local Group mass estimates from the Timing Argument
9:20	Jay Baptista	Yale University	Orientations of Dark Matter Haloes in CDM and SIDM Latte Galaxies (virtual)
9:30	Zhaozhou Li	Hebrew University of Jerusalem	Modeling the Response of Dark Matter Halos to Gas Ejection (virtual)
9:40	Andreia Jessica Carrillo	Durham University	Can we really pick and choose? Benchmarking various selections of accreted halo stars in observations with simulations (virtual)
9:50	Elise Darragh-Ford	Stanford University	Understanding the Impact of Formation History on the Dynamical Distribution of Substructure using

			the "Milky Way"est Simulation Suite

Morning Coffee Break
10:00 - 10:30

Dynamics Beyond Neptune
Chair: William Oldroyd
Slack Chair: Sam Hadden
10:30 - 12:00

10:30	Konstantin Batygin	Caltech	The Stability Boundary of the Distant Scattered Disk
10:40	Matthew Belyakov	Caltech	The Stability Boundary of the Scattered Disk: Octupole and Beyond
10:50	Brett Gladman	University of British Columbia	Secular free inclinations in the main Kuiper Belt (virtual)
11:00	Samantha Lawler	University of Regina	The Populations of Plutinos and Other Resonant TNOs in the Distant Solar System (virtual)
11:10	Kathryn Volk	University of Arizona	Close enough? How variations in the giant planets & final orbits in migration simulations affect predicted resonant transneptunian populations
11:20	Arcelia Hermosillo Ruiz	University of California, Santa Cruz	Constraints on Migration Scenarios of Neptune Due to Stochasticity (2021 Duncombe)
11:30	Alexander Zderic	University of Colorado, Boulder	Spontaneous Symmetry Breaking in the Primordial Scattered Disk
11:40	Arnav Das	Caltech	On the secular dynamics of putative astrophysical disk in the outer solar system (virtual)
11:50	Yukun Huang	University of British Columbia	A Rogue Planet Populated the Distant Kuiper Belt (virtual)

Lunch Break
12:00 - 1:00

Mapping and modeling the Milky Way's tidal streams
Chair: Elena D'Onghia
Slack Chair: Farnik Nikakhtar
1:00 - 2:00

1:00	Shifra Mandel	Columbia University	Unlocking the History of Galaxy Mergers Through the Automated Analysis of Tidal Debris Substructures
1:10	Khyati Malhan	MPIA, Heidelberg	The Global Dynamical Atlas of the Milky Way mergers: Processing the ESA/Gaia dataset using state-of-the-art algorithms (virtual)
1:20	Thomas Donlon	Rensselaer Polytechnic Institute	Identifying the Multiple Radial Mergers in the Local Stellar Halo with Chemodynamics
1:30	Nora Shipp	Massachusetts Institute of Technology	Too Big to Fail? 6D Stellar Streams in the Milky Way and Cosmological Simulations
1:40	Jacob Nibauer	Princeton University	Charting the Galactic Acceleration Field with Stellar Streams -- A Flexible Model Independent Approach
1:50	Nondh Panithanpaisal	University of Pennsylvania	Using Tidal Streams To Constrain Halo Minor Axis

Near-Earth Objects: From Asteroids to Meteoroids
Chair: Harrison Agrusa
Slack Chair: Matija Cuk
2:00-3:00

2:00	Althea Moorhead	NASA Marshall Space Flight Center	Modeling the meteoroid environment far from the ecliptic plane (virtual)

2:10	Matthew Tiscareno	SETI Institute	The effects of comet ejection characteristics on meteoroid stream cross-section profiles
2:20	Oscar Fuentes Muñoz	University of Colorado, Boulder	Obliquity evolution of NEOs due to planetary flybys and YORP (virtual)
2:30	Jose Castro	University of Arizona	Earth's Quasi-satellite Kamo'oalewa's Possible Origin as Lunar Ejecta (virtual)
2:40	Travis Yeager	Lawrence Livermore National Laboratory	Early results from the MEGASIM: Multitudinous Earth Greek (not Trojan) Asteroid SIMulation (virtual)
2:50	Daniel Scheeres	University of Colorado, Boulder	Limits on Energy and Angular Momentum in the Full N-Body Problem (virtual)

Afternoon Coffee Break
3:00 - 3:30

Rubin Prize Talk
Ann-Marie Madigan
Chair: Dan Tamayo
Slack Chair: Juliette Becker
3:30-4:15

Brouwer Prize Talk
Amina Helmi
Chair: Ruth Murray-Clay
Slack Chair: Kathryn Volk
4:15-5:00

Mentoring Event
Juliette Becker
5:00 - 6:00

Wednesday, April 27th

Introduction and Announcements
Dan Tamayo, Kathryn Johnston, Ruth Murray-Clay
SOC, LOC and DDA Chairs
8:00 - 8:10

Special Session: Compact Object Binaries I: AGN Disk Environments
Chair: Sanaea Rose
Slack Chair: Yubo Su
8:10-9:10

8:10	Yihan Wang	Stony Brook	Symmetry

		University	breaking in dynamical encounters in the disks of active galactic nuclei
8:20	Jiaru Li	Cornell University	Long-term Evolution of Tightly-Packed Stellar Black Holes in AGN Disks: Formation of Merging Black-Hole Binaries via Close Encounters
8:30	Hareesh Gautham Bhaskar	Georgia Institute of Technology	Blackhole mergers through evection Resonances
8:40	Gongjie Li	Georgia Institute of Technology	Spin Variations of Black Hole Binaries in AGN Disks
8:50	Gaia Fabj	University of Heidelberg	Star-Disk Interactions in Active Galactic Nuclei (virtual)

Poster Pops
Chair: Sanaea Rose
9:00-9:10

Special Session: Compact Object Binaries II: Cluster Environments
Chair: Gongjie Li
Slack Chair: Samuel Grunblatt
9:10-10:00

9:10	Xian Chen	Peking University	Distortion of Gravitational Wave Signals by Astrophysical Environments (virtual)
9:20	Sanaea Rose	University of California, Los Angeles	Collisions in a Galactic Nucleus: Implications for Compact Object Formation and Gravitational Wave Sources
9:30	Mor Rozner	Technion	Binary evolution, gravitational-wave mergers and explosive transients in multi ple-populations gas-enriched globular-clusters (2022 Duncombe)
9:40	Stefano Torniamenti	University of Padova	Formation channels of binary black hole mergers in young star

			clusters (virtual)
9:50	Johan Samsing	Niels Bohr Institute	Distinguishing Dynamical Formation Channels Apart Using Burst Timing

Morning Coffee Break
10:00 - 10:30

Dynamical Interactions in Multi-Planet Systems
Chair: Laetitia Rodet
Slack Chair: Christopher O'Connor
10:30 - 11:30

10:30	Sarah Millholland	Princeton University	Edge-of-the-Multis: Evidence for Truncation of the Outer Architectures of Compact Multiple-Planet Systems
10:40	Thea Faridani	University of California, Los Angeles	Stable or Not: Constraining the Stability of Hidden Super-Short Period Planets (virtual)
10:50	Spencer Wallace	University of Washington	An In-Situ Formation Model for Systems of Tightly-Packed Inner Planets (virtual)
11:00	Ryleigh Davis	Caltech	Rapid Dynamical Chaos in a Short Period Multi-planet System
11:10	Yubo Su	Cornell University	Dynamics of Colombo's Top: Non-Trivial Oblique Spin Equilibria of Super-Earths in Multi-planetary Systems (2020 Duncombe)
11:20	Jiayin Dong	Pennsylvania State University	Two Case Studies of Warm Jupiters Suggesting Different Origins (2021 Duncombe)

History of the Early Solar System
Chair: Konstantin Batygin
Slack Chair: Gongjie Li
11:30 - 12:00

11:30	Matthew Clement	Carnegie Institute of Washington	Mercury and the inner solar system sculpted by Earth

			and Venus' outward migration
11:40	Rogerio Deienno	Southwest Research Institute	Effects of Jupiter large scale gas-driven migration on the inner solar system
11:50	Seth Jacobson	Michigan State University	Venus: What does it mean to have no moon

Lunch Break
12:00 - 1:00

Special Session: Astro 2020 Decadal, State of the Profession
Kathryn Johnston, Kathryn Daniel, Gurtina Besla
Slack Chair: Ryleigh Fitzpatrick
1:00-2:30

Afternoon Coffee Break
2:30-3:00

Public Program
American Museum of Natural History Planetarium
Jackie Faherty
4:00-5:30

Thursday, April 28th

Introduction and Announcements
Dan Tamayo, Kathryn Johnston, Ruth Murray-Clay
SOC, LOC and DDA Chairs
8:00 - 8:10

Galactic Bars
Chair: Jason Hunt
Slack Chair: Zephyr Penoyre
8:10 - 9:00

8:10	Maddie Lucey	University of Texas	Constraining the length and pattern speed of the Milky Way bar from direct orbit integration (2022 Duncombe)
8:20	Sioree Ansar	Indian Institute of Astrophysics, Bangalore, Flatiron Institute	Bar Formation and Destruction in the FIRE2 Simulations (virtual)
8:30	Binod Bhattarai	University of California, Merced	Resonance Sweeping in Barred Galaxy Simulations
8:40	Shashank Dattathri	University of Michigan	Deprojection and dynamical modeling of barred galaxies
8:50	Elena D'Onghia	University of	Are dark gaps in

		Wisconsin	barred galaxies a signature of bar corotation?

Numerics and Methods for Planetary Dynamics
Chair: Michelle Vick
Slack Chair: Joseph A'Hearn
9:00 - 10:00

9:00	Stanley Dermott	University of Florida	A new method of searching for ghost families in the asteroid belt
9:10	Mohamad Ali-Dib	New York University, Abu-Dhabi	A machine-generated catalogue of Charon's craters and implications for the Kuiper belt (virtual)
9:20	William Oldroyd	Northern Arizona University	A Statistical Approach to Optimizing Orbit Constraints for Directly Imaged Exoplanets
9:30	David Hernandez	Harvard-Smithsonian Center for Astrophysics	Stepsize errors in the N-body problem: discerning Mercury's true possible long-term orbits
9:40	Samuel Hadden	Canadian Institute for Theoretical Astrophysics	Celestial mechanics with the celmech code
9:50	Daniel Tamayo	Princeton University	Celmech II: A universal integrable model for mean motion resonances in closely packed systems

Morning Coffee Break
10:00 - 10:30

Planetary Rings
Chair: Maryame El Moutamid
Slack Chair: Rogerio Deienno
10:30 - 11:00

10:30	Matthew Hedman	University of Idaho	Using disk structures as historical records: A case study involving Saturn's rings.
10:40	Joseph A'Hearn	University of Idaho	Ring Seismology of the Ice Giants

			Uranus and Neptune
10:50	Daniel Sega	University of Colorado, Boulder	The motion of satellite self-gravity wakes under the effects of tidal forces and shear: a case study of the Rings of Saturn.

Members' Meeting
Ruth Murray-Clay
Slack Chair: Sarah Millholland
11:00 - 12:00

Lunch Break
12:00 - 1:00

Resonant Dynamics and Consequences, Plus Disks!
Chair: Samuel Hadden
Slack Chair: Jiayin Dong
1:00 - 2:00

1:00	Max Goldberg	Caltech	Architectures of Compact Super-Earth Systems Shaped by Instabilities (2021 Duncombe)
1:10	Nader Haghighipour	University of Hawaii	Diversity of resonances in multi-planet resonant chains is a natural outcome of planet formation (virtual)
1:20	Jordan Laune	Cornell University	Apsidal Architecture of Planetary Systems in Mean Motion Resonance
1:30	Roberto Tejada Arevalo	Princeton University	Stability Constrained Characterization of the 23 Myr-old V1298 Tau System: Do Young Planets Form in Mean Motion Resonance Chains? (2022 Duncombe)
1:40	Maryame El Moutamid	Cornell University	Three-Body Resonances in the Saturnian System
1:50	Marguerite Epstein-Martin	Columbia University	Generating stellar obliquities in systems with broken

			protoplanetary disks (virtual)
2:00	Michelle Vick	Northwestern University	Modeling the Irradiation Instability of Protoplanetary Disks

Dynamics near supermassive black holes
Chair: Ann-Marie Madigan
Slack Chair: Janosz Dewberry
2:10 - 2:50

2:10	Aleksey Generozov	Technion	Forming Young and Hypervelocity Stars in the Galactic Centre via Tidal Disruption of a Molecular Cloud
2:20	Denyz Melchor	University of California, Los Angeles	Repeated tidal disruption events in supermassive black hole binaries
2:30	Makana Silva	The Ohio State University	Dynamical perturbations around an extreme mass ratio inspiral near resonance (virtual)
2:40	Tatsuya Akiba	University of Colorado, Boulder	The Beginning of an END (2021 Duncombe)

Analysis of equilibrium collisionless systems: power and peril
Chair: Chris Hamilton
Slack Chair: Natascha Manger
2:50 - 3:40

2:50	Farnik Nikakhtar	University of Pennsylvania	Probing the Galactic Potential Using Optimal Transport Theory
3:00	Micah Oeur	University of California, Merced	Orbital Torus Imaging on FIRE
3:10	Alexander Riley	Texas A&M University	Velocity dipoles in the halos of FIRE simulated galaxies
3:20	Kaustav Mitra	Yale University	Dynamical modelling of satellite galaxies to infer galaxy-halo connection and cosmology
3:30	Juan Guerra	Yale University	Jeans modeling of Simulated Dwarf Satellites Around a Milky Way like Galaxy

Concluding Remarks
Chair: Ruth Murray-Clay

3:40-3:50

End of Meeting
3:50

Poster Presentations

Available all week

1	Yubo Su	Cornell University	Diminished Generation of Stellar Obliquities: The Angular Momentum Budget During Resonance Crossing
2	Matthias He	Pennsylvania State University	Debiasing the Minimum-Mass Extrasolar Nebula: Planet Multiplicity and the Diversity of Solid Density Profiles
3	Sachi Weerasooriya	Texas Christian University	Dancing Streams in Merging Halos: Effects of Major Mergers on Stellar Streams
4	Rixin Li	Cornell University	Hydrodynamical Evolution of Black-Hole Binaries Embedded in AGN Disks
5	Carrie Filion	Johns Hopkins University	Local Group Dynamics with the Subaru Prime Focus Spectrograph
6	Laetitia Rodet	Cornell University	On the Correlation between Hot Jupiters and Stellar Clustering: High-eccentricity Migration Induced by Stellar Flybys
7	Vaclav Pavlik	Indiana University	Environmental Effects on the Dynamical Evolution of Star Clusters in Turbulent Molecular Clouds
8	Hayden Foote	University of Arizona	Making Observational Predictions for the LMC's Dynamical Friction Wake
9	Jorge Perez-Hernandez	Telespazio Germany GmbH	LSIM: a cloud-based tool for lunar mission analysis and design
10	Arpit Arora	University of Pennsylvania	Subhalos-stream interaction in the presence of massive satellites.
11	Alex Meyer	University of Colorado, Boulder	Janus: A NASA SIMPLEx mission to explore two NEO Binary Asteroids

12	Jordan Laune	Cornell University	Differential Apsidal Precession in Mean Motion Resonant Planetary Systems
13	Christian Aganza	University of California San Diego	Probing Gaps in Globular Cluster Streams in External Galaxies with the Nancy Grace Roman Telescope

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