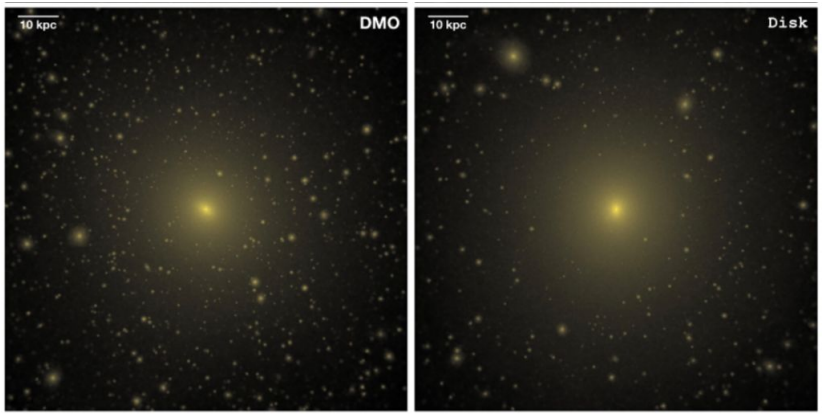
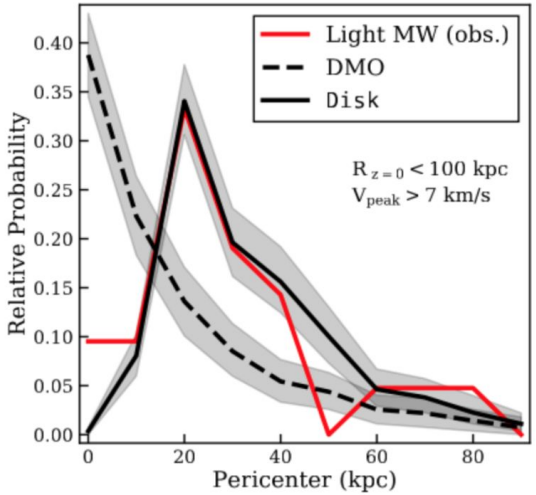
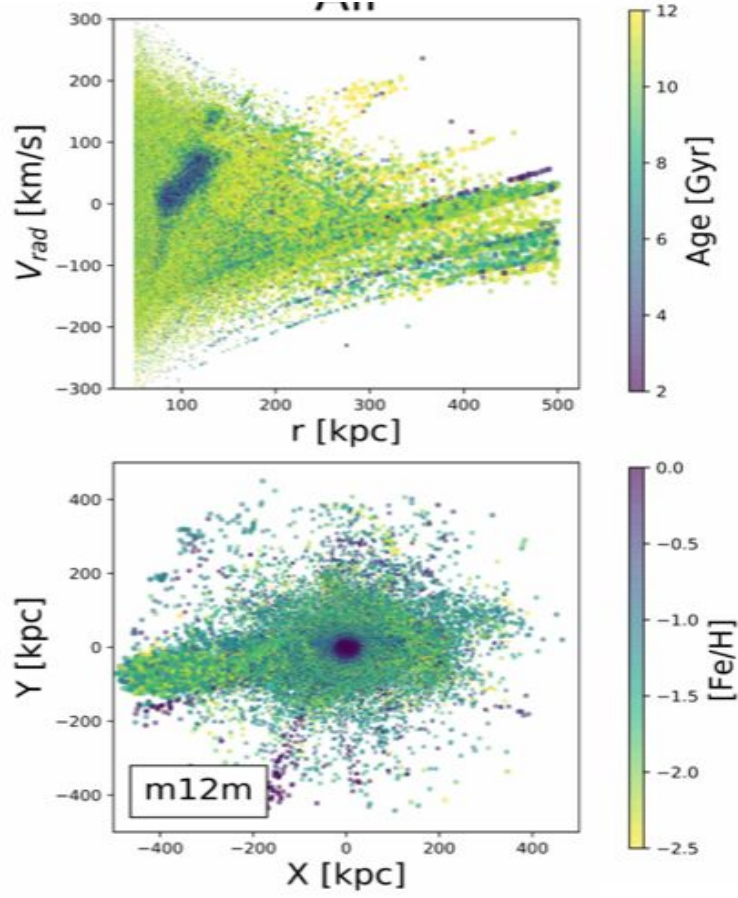




Cosmological subhalo/satellite dynamics with disk potential.

James Bullock
(UC Irvine)

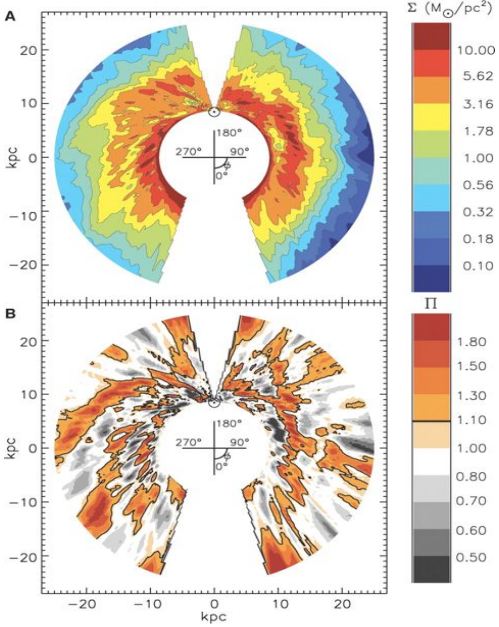
Stellar halo formation / FIRE simulations



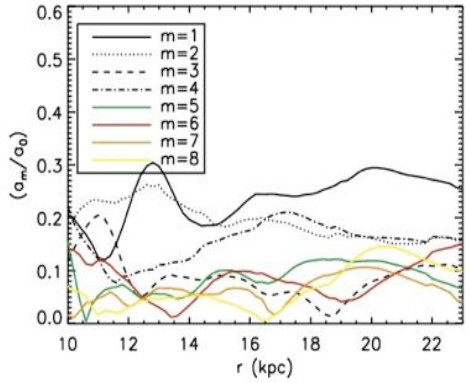
Sukanya Chakrabarti (RIT)

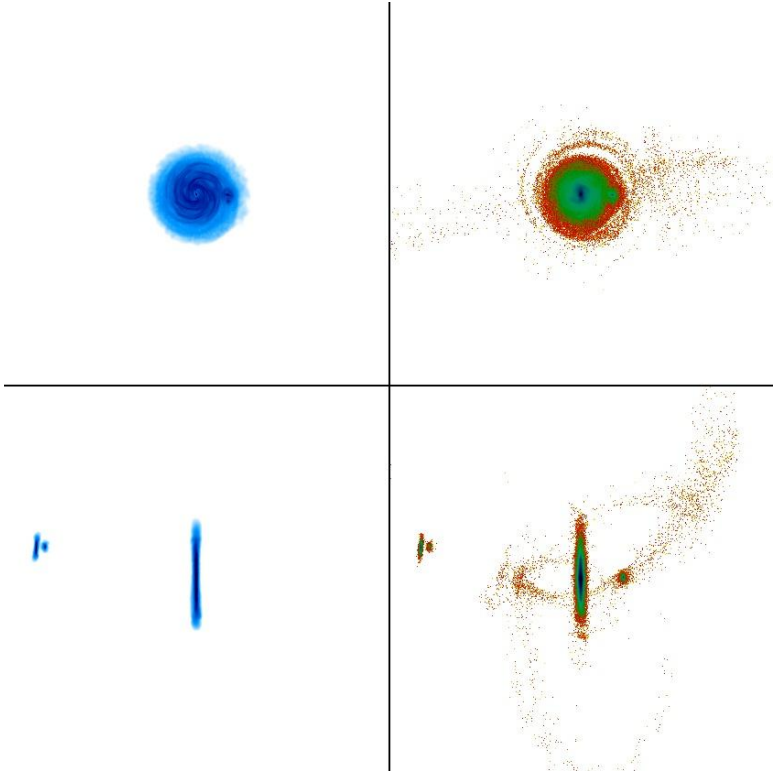
(Galactic dynamics) Interests:

- Effects of Milky Way satellites on gas ***and*** stellar disk and the dark matter halo (SPH and test particle simulations)
- Galactoseismology
- Variable stars



Levine, Blitz & Heiles 06





Chakrabarti & Blitz 09

Anthony Brown

Leiden Observatory

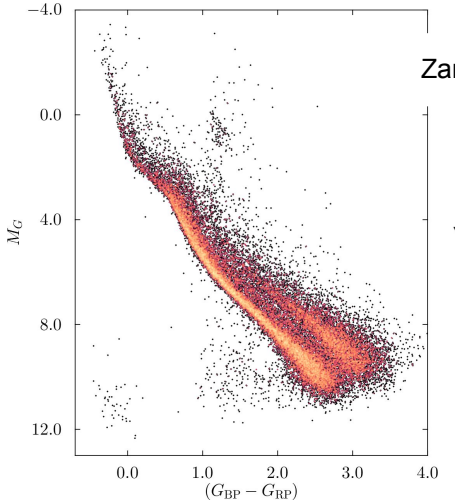
Interests

- OB associations, young star clusters, moving groups
- Milky Way: archaeology, hypervelocity stars
- Any application of Gaia data
- Your wishes for Gaia data access and documentation

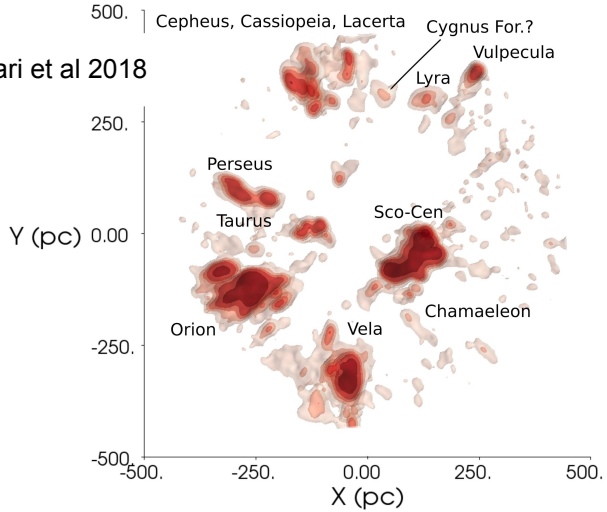
Happy to provide

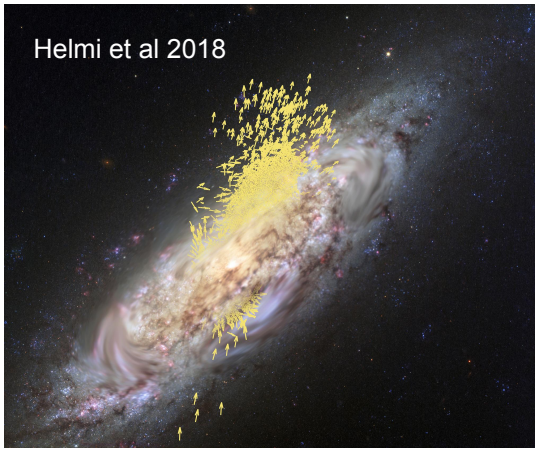
- Guidance on use and interpretation of Gaia data
- Discussion on future astrometry missions*
- (Do my best to) answer any questions you have on Gaia

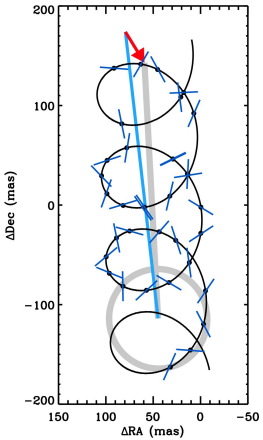
*https://www.cosmos.esa.int/web/voyage-2050/home



Zari et al 2018







Snellen & Brown 2018

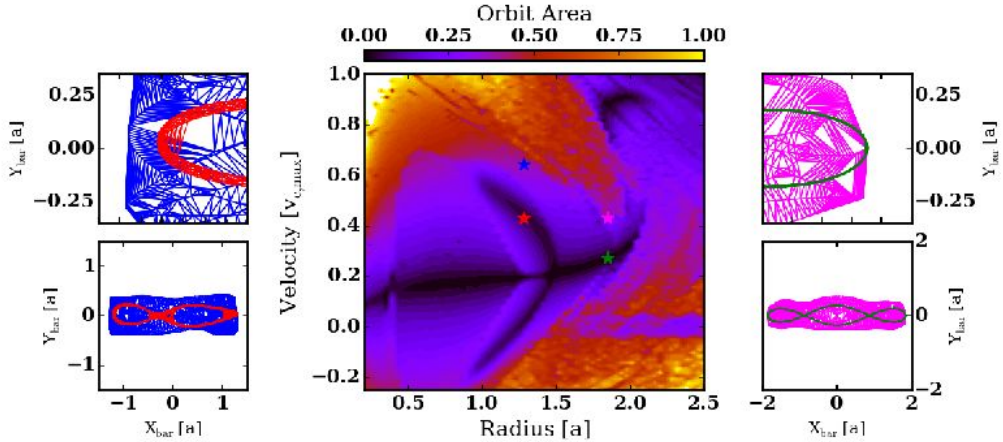
Martin Weinberg (UMass)

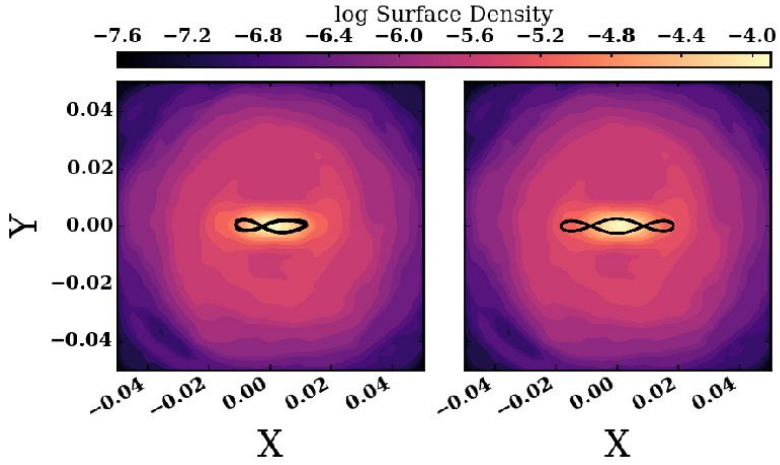
Ask me about:

- Wakes, warps, bars, chaos
- Bars/resonant interactions
- Bar kinematics with GAIA/IFUs
- Dynamical non-parametrics

Want to know:

- Bar-driven kinematics with GAIA
- Does chaos matter?
- Constraints on DM
- Do simulations really work?



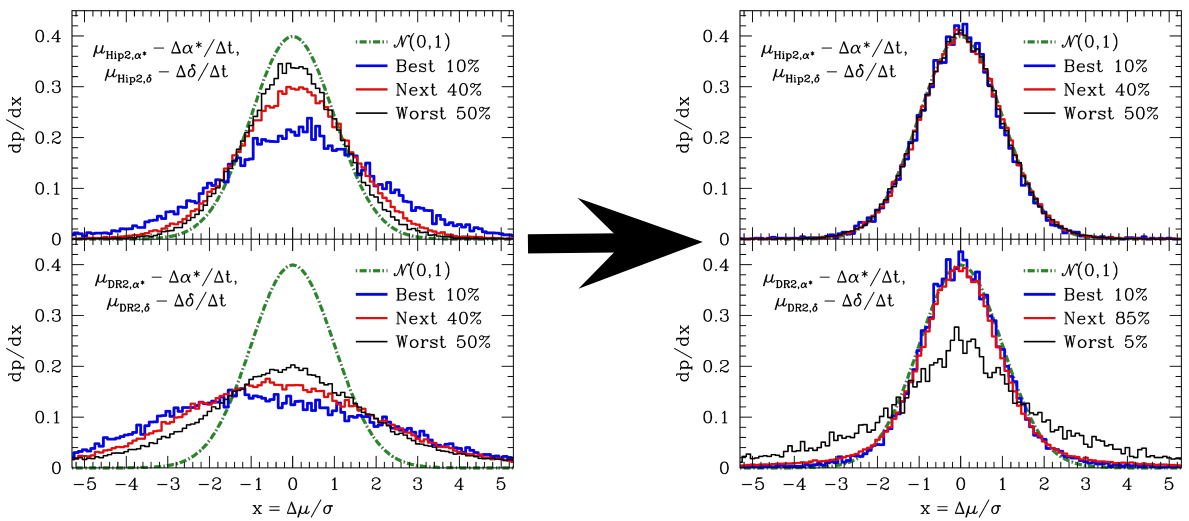


Tim Brandt
UCSB

Interests:

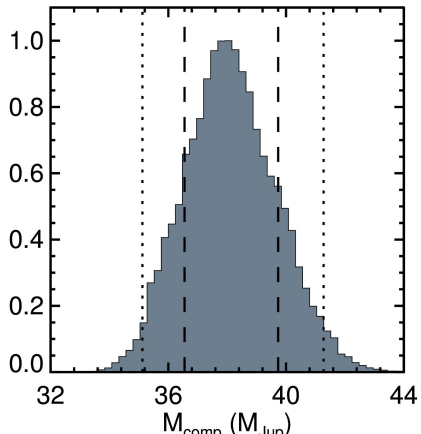
- Exoplanets, brown dwarfs, stars, stellar remnants
- Calibrating and understanding *Gaia* uncertainties, systematics
- Fitting astrometric orbits

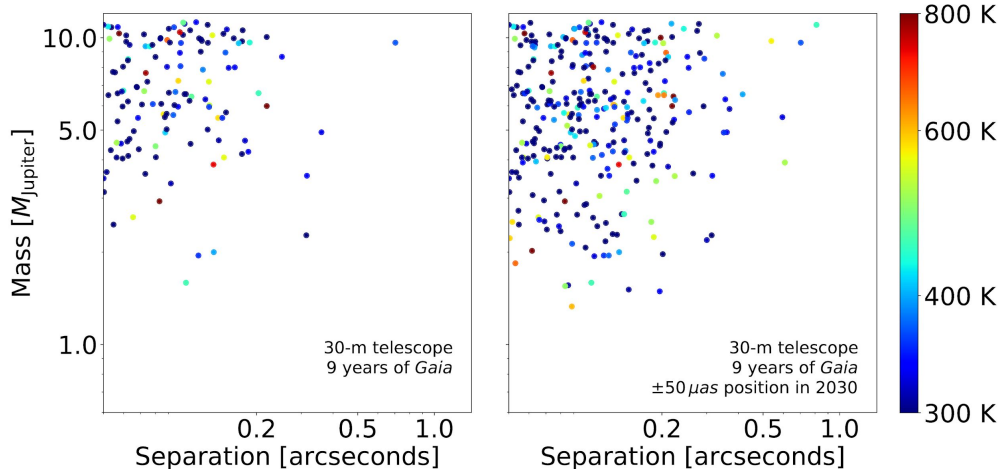
I am easily distracted and always eager to collaborate!



A single *WFIRST* epoch can calibrate *Gaia*, extend its baseline by 10 years, find hundreds of planets to image, measure their dynamical masses

P~100-400 years GI 758B





Charlie Conroy

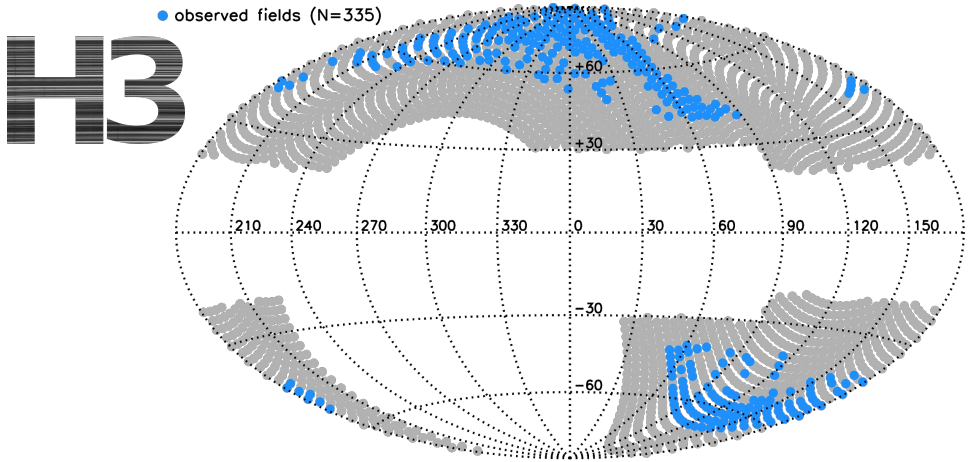
Harvard/CfA

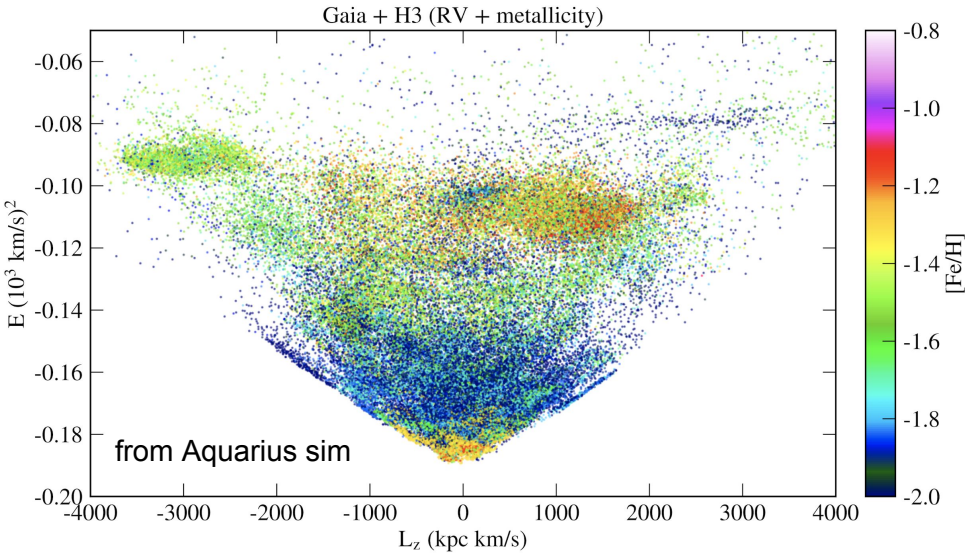
Interests

- MW stellar halo
  - H3 spectroscopic survey: h3survey.rc.fas.harvard.edu
- Structure in the disk due to clustered star formation (Gaia+chemistry)
- Stellar evolution (MIST)
- Stellar parameter determination
- Star clusters

Would like to learn more about

- How to quantify structure in phase space
- How to build a (simple?) model for hierarchical star formation
- Resonances (really!)





Adrian Price-Whelan

(Princeton University)

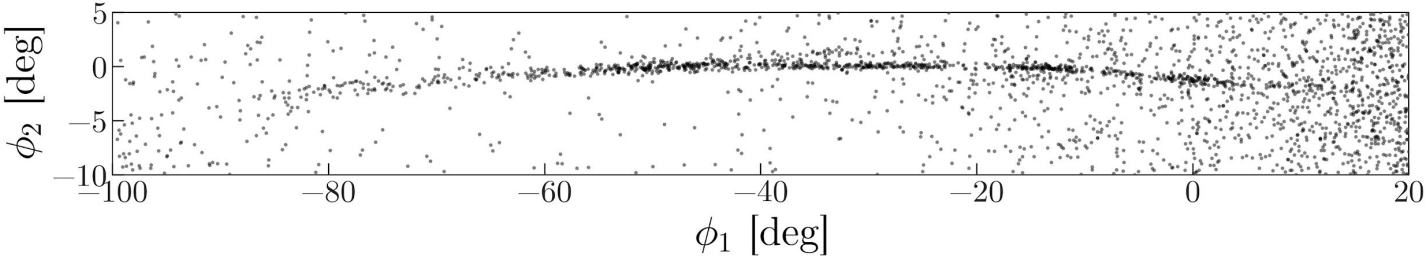
Interests:

- Stellar streams & dark matter
- The (outer) Milky Way disk
- Binary stars: wide or spectroscopic

Ask me about:

- Python / AstroPy
- Computational dynamics (in Python, e.g., Gala)
- Statistics / inference

1) *the GD-1 stream:* a perturbed stellar stream



Fully characterize the stream:

- Luminosity function?
- Age, chemistry?
- Density perturbations?

↳ ***Selection function***

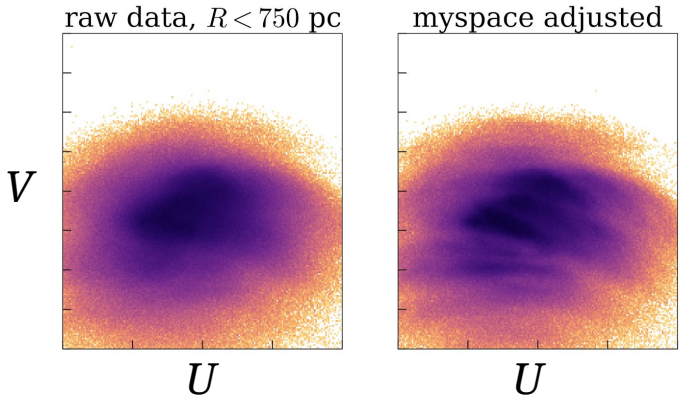
2) *"myspace": data-driven classification of disk stars*

Because action-space is not a thing!

We can learn what stars belong to:

- Resonances / coherent velocity features
- Moving groups / disrupting clusters
- Impulsive / short-lived perturbations

without assumptions about the potential



Benny Tsang (KITP, Rm 2407)

Interests:

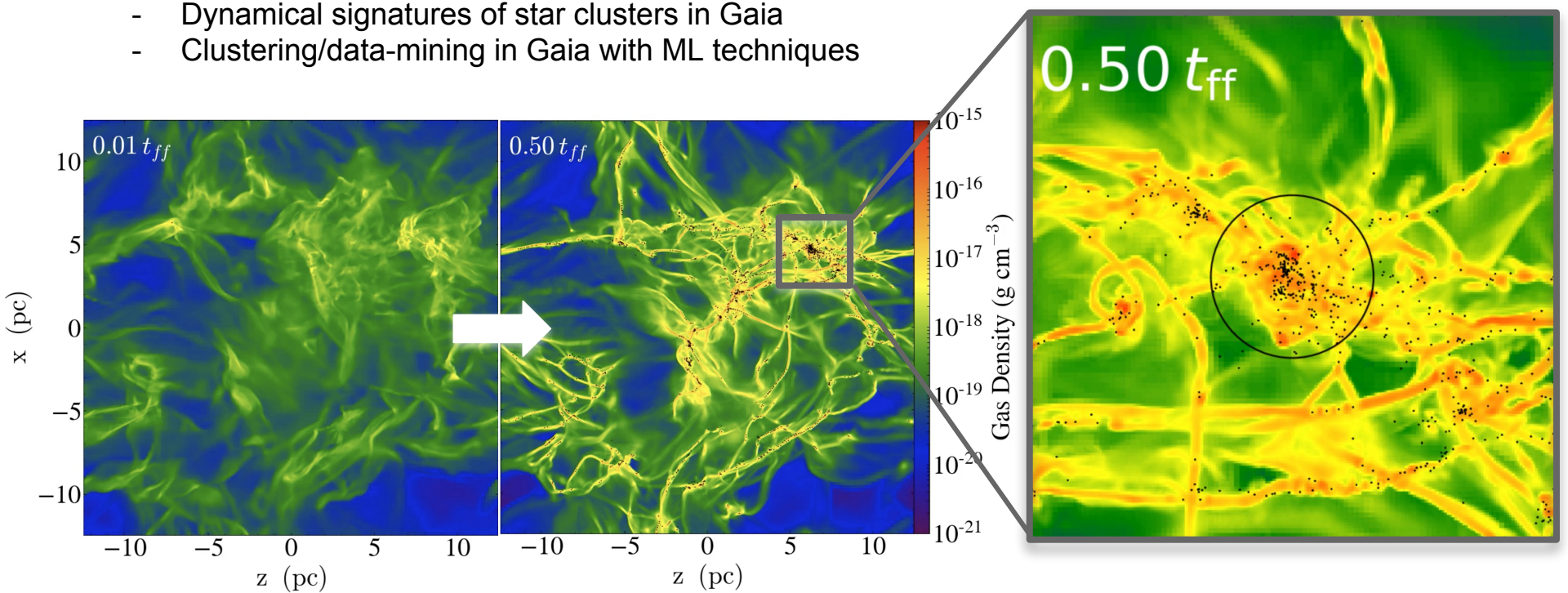
- Simulate hierarchical star cluster formation
- Stellar feedback in turbulent star-forming clouds
- Radiation transfer/hydrodynamics

Wish to explore:

- Dynamical signatures of star clusters in Gaia
- Clustering/data-mining in Gaia with ML techniques

Talk to me about:

- Star cluster formation, stellar feedback, radiation transfer, machine learning



Christophe Pichon

IAP/Paris

Interests

- Galactic/DM dynamics
- Secular evolution/kinetic theory
- Impact of LSS on galaxies

Would like to learn more about

- GAIA's dynamical picture of the MW
- Disk thickening, radial migration, warps, streams
- Who wins, when, where in driving galaxies's fate?

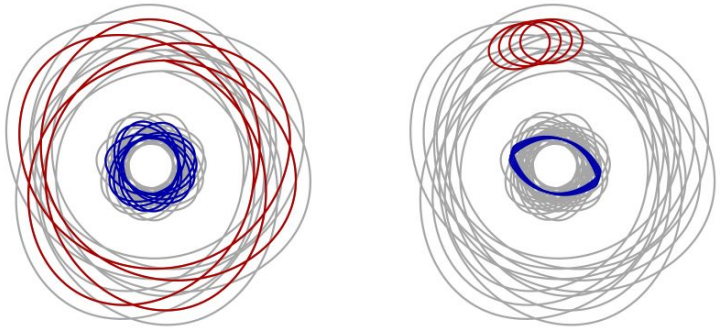
Happy to share

- Some understanding(?) of LSS + gal. dynamics
- www.horizon-simulation.org
- Skeletons

Resonant stellar encounters

The idea behind secular evolution: shot noise **fluctuations resonate!**

- **Resonance condition:** $\delta_D(m_1 \cdot \Omega_1 - m_2 \cdot \Omega_2)$



The two (*blue* and *red*) sets of orbits satisfy the resonance condition $\mathbf{m1 \cdot \Omega 1 = m2 \cdot \Omega 2}$, and therefore will interact consistently, driving a significant distortion of their shapes.

Small recurrent (resonant) effects drive secular evolution (via orbital disto

Lauren Anderson Flatiron Institute @ KITP until March 30th

Projects I plan to think about while I'm here:

- Interesting dynamical features in a 3D dust map out to a few kpc? 10 kpc? Using a GP we've scaled up to 1e5 observations running in a few minutes on my laptop. Currently applying method to synthetic Gaia survey of Latte, a high res zoom sim
- Using streams to constrain dynamical history of the Milky Way: how can we build a realistic potential/force field from parameters which we can sample efficiently?

Would like to discuss/compare halo shape predictions from different classes of DM models, and think about what kind of precision we need to tell the difference

My strengths: curious about big data analysis problems and data viz, interacted with the Gaia data a bit and Ananke, comfortable with simulations, Python, GP 101 description

Ben Lewis (RIT)

Until March 22nd

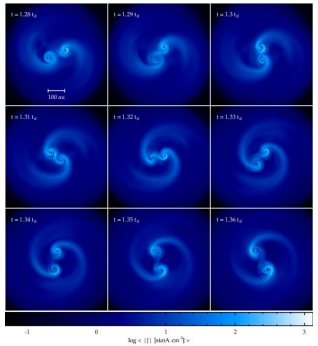
I also love coding problems. Ask Sukanya for a recommendation!

What do I do?

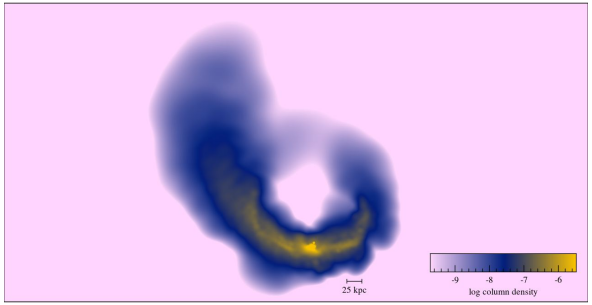
It's not scary!

Problems with magnetic fields? Come see me :-)

Star formation



MW/LMC/SMC interactions



Interests:

Better initial conditions:

- link GAIA to galaxy scale
- galaxy scale to cluster
- cluster to single stars
- and back up

Think 'distance ladder'

Adding magnetic fields to calculations where they ought to be included, but are not at present.

Ditto, but radiative transfer.

More recently, moonlighting as an observer hunting lensed supernovae.

Ask me about: role of magnetic fields; RT; SPH/MFM/etc. simulations on just about any scale; unusual code problems; star formation.

Kohei Hattori (U of Michigan)

Interests (as of March 5th):

- Using **hypervelocity** stars to constrain the MW potential
- Finding sibling field halo stars of the known r-II stars (or chemically peculiar **metal-poor** stars)
- Signature of merger history (**phase-space distribution** in action space etc.)

What I can provide:

- Stellar dynamics in general; AGAMA (dynamics code by Eugene Vasiliev)

What I want to learn:

- *Efficient* clustering algorithms (DBSCAN?)
- *Efficient* way of cross-matching with Gaia and other surveys (I know only basics of ADQL).
- Anything about statistics / MCMC method etc.

Peter Craig (RIT)

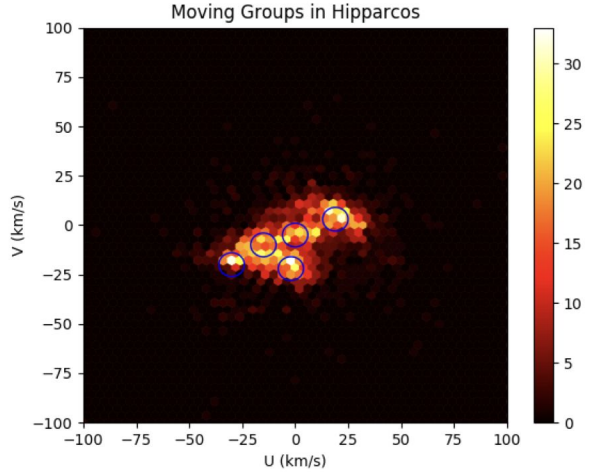
I'll only be here for this week

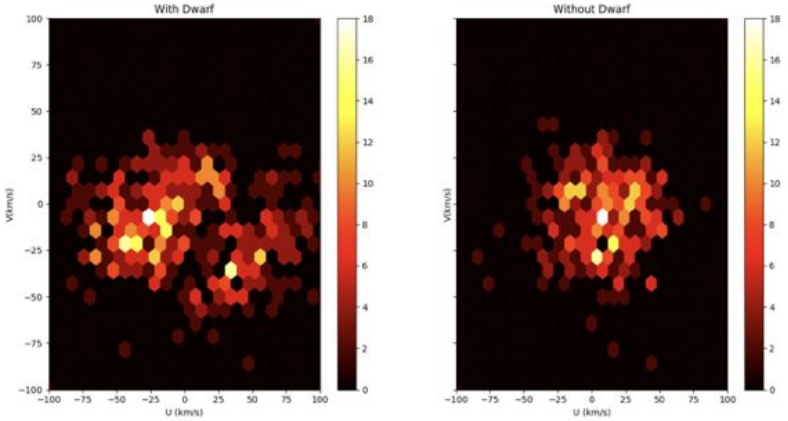
Interests:

- Moving groups
- Effects of dwarf galaxies on the Milky Way
- Ripples in the Milky Way disk
- SPH / MHD Simulations
- I recently have been searching for gravitationally lensed supernovae

What I'd like to learn:

- Anything about statistics
- Anything about magnetic fields
- Structures and dynamics in the MW from Gaia





Hamish Silverwood

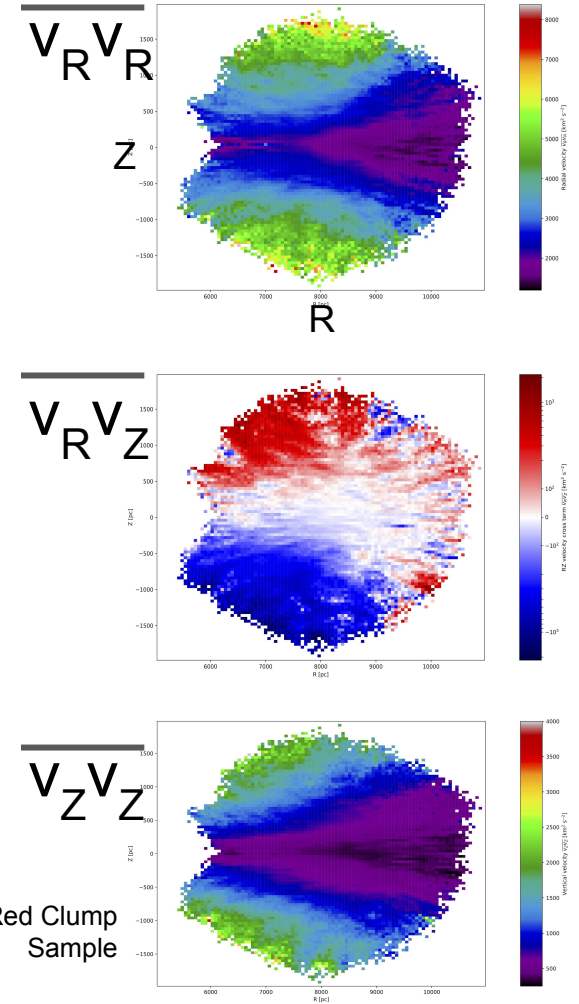
Dark Matter Jack-of-All-Trades, ICC Barcelona

Current projects and interests:

- GravImage2D: Local Dark Matter Density using R and Z motions →
- Δ-Jeans Method: bottom up method to compare the disequilibria between populations.
- Directly probing MW potential with stellar accelerations from high precision exoplanet hunting spectrographs.
- Background in indirect and direct DM detection.

Want to Learn/Discuss/Explore:

- Selection functions. Planning to get to grips with `seestar` code.
- Numerical differentiation methods for Δ-Jeans.
- Is there a characteristic scale for disequilibria? Use this to set smoothing scale for differentiation/fitting.
- Other bottom up analysis ideas for MW dynamics (CBE + numerically estimated DF?)



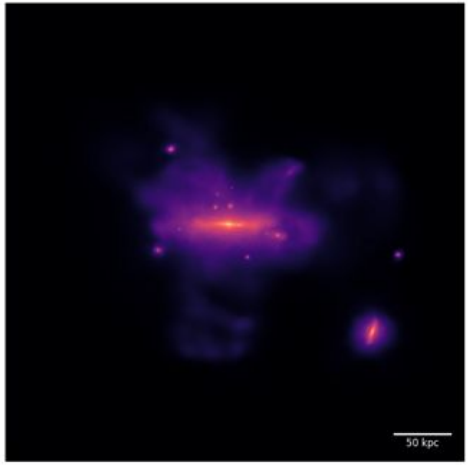
Andreea Font (Liverpool John Moores University, UK)

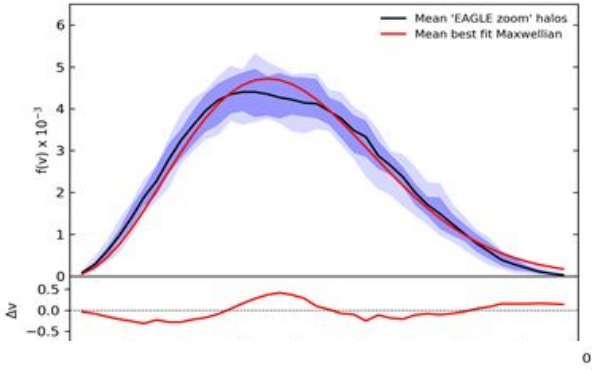
- interested in the formation of stellar halos, the origin of in situ halo, and modeling of tidal streams.

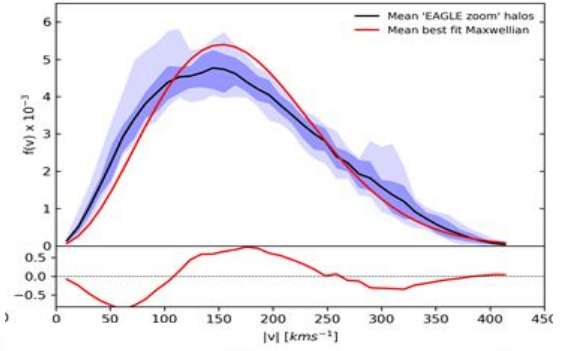
- one goal is to create mock stellar catalogues for Gaia and other galactic surveys.

Trying to answer all these with:
a new suite of zoomed cosmological simulations of Milky Way-mass disc galaxies ran with the EAGLE code:

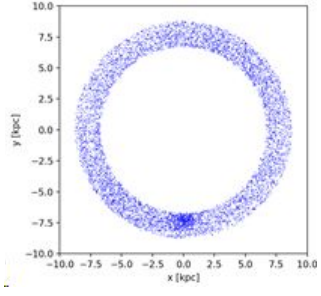
- many MW realisations
- both hydro and DM only
- $m_*, m_{DM} \approx 10^5 M_\odot$







❖ I am also interested in estimating **the local DM distribution** in these simulations and understanding the limitations of the standard halo model. Some of the simulated ``solar neighborhoods'' show signs of substructure.

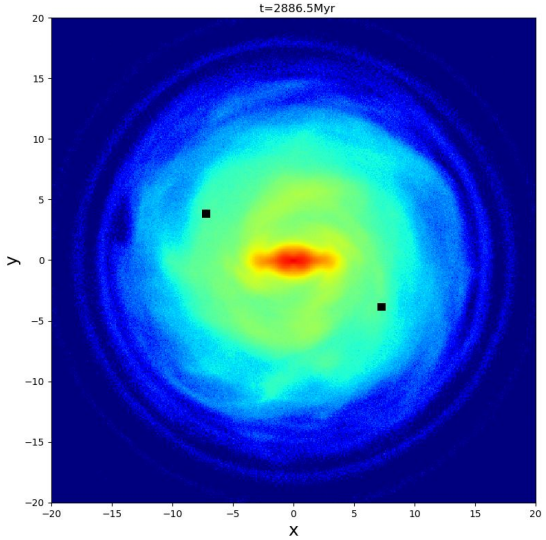


Things I'd like to learn here: what type of models people use to infer the local DM density using star tracers from Gaia. Can simulations be used to get better constraints on these measurements?

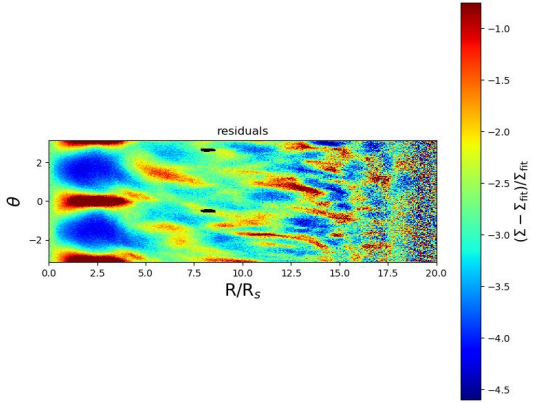
Elena D'Onghia (UW-Madison)

Current projects:

- The origin of moving groups in the solar vicinity, in particular the Hercules group.
- The effects of time-varying potential on the surface density



GALAKOS

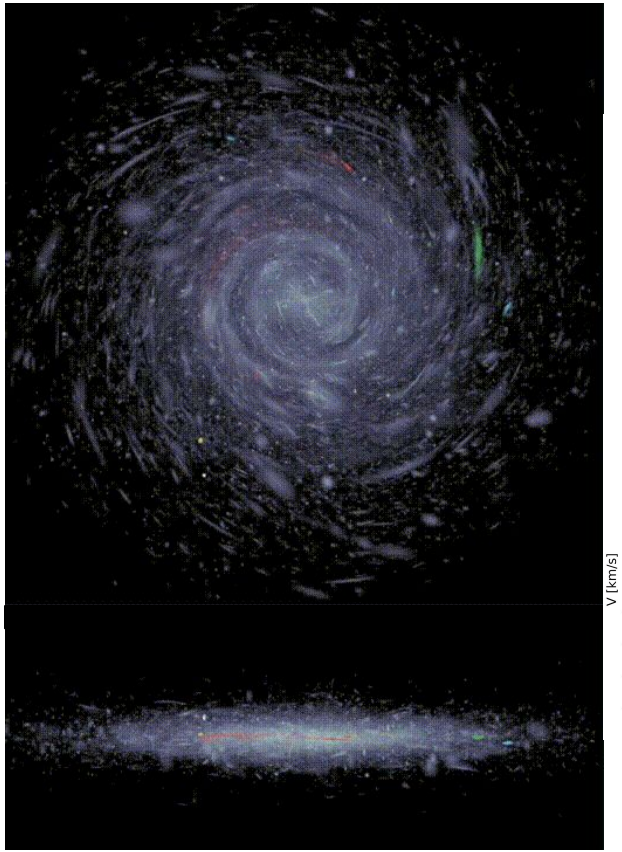


I want to learn more about:

- Formation of open clusters
- Stars trapped on resonances/chaos

Harshil Kamdar

Harvard

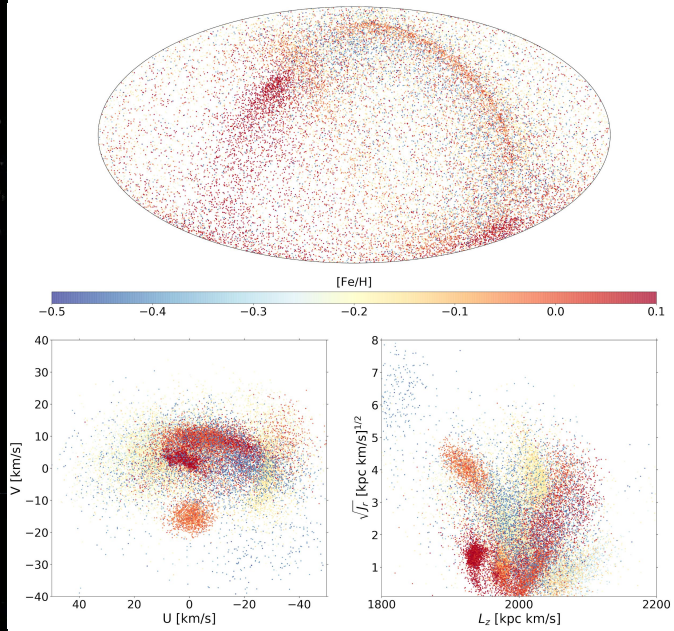


Interested in learning about:

- hierarchical star formation
- evolution of gas in the MW disk

Can help with:

- star cluster dynamics
- clustering
- machine learning



A simulation of all* stars born in star clusters in the Milky Way disk in the last 5 Gyr.

Simulation includes:

- a realistic potential (bar + spiral + GMCs)
- a subgrid model for cluster birth and evolution
- a semi-empirical chemical model

*F, G, K stars

Martin C. Smith - Photometric ages

John Vickers - Disc evolution & BHBs

João Amarante - Halo/thick-disc interface

Zhen Yuan - Halo substructures

Yanqiong Zhang - Runaway stars