

Joaquín García de la Cruz



Title

On the flaring of Thick Discs of Galaxies: Insights from Simulations.

Abstract

The merger history of a galaxy has a direct impact on the structure of its geometrically defined thick disc. Among other effects, mergers induce flaring in the stellar populations in the disc, which can be reflected on the thick disc's age structure. As we are studying the age structure of thick discs in the MW and nearby galaxies with an unprecedented level of detail, it is important to use simulations in order to have a more comprehensible picture of the diversity of thick disc age structures, and their connection to the galaxies' merger histories.

In this talk, I will present the results of an analysis performed on a sample of 27 simulated MW mass galaxies in their cosmological context, where we explore the connection between the flaring of mono-age populations (MAPs), thick disc flaring, thin/thick disc separation, and thick disc's age structure. I will explain under which conditions MAPs create flat thick discs, and how these galaxies form a continuum thin/thick structure, have radial age gradients, and tend to have quiescent recent merger histories, similar to our understanding of the Galaxy. Conversely, I will show the different scenarios we find where MAPs can create flared thick discs, with these galaxies showing a wider variety of the aforementioned features.

In conclusion, the results presented in this talk are in agreement with the emerging picture of thick discs being diverse and complex components of external galaxies, which when studied in detail, can provide vital constraints for the formation and evolution of disc galaxies.

Joaquín García de la Cruz

Email:
j.garciadelacruz@2017.ljmu.ac.uk
LinkedIn:
Joaquín García de la Cruz

EDUCATION

Liverpool John Moores University Ph.D. in Computational Astrophysics, Advisor: Marie Martig – Thesis: “Galactic Archology using Thick Discs of Galaxies”	Liverpool, UK 2017–Current
University of Liverpool Ph.D. in Astrophysics & Big Data, Centre for Doctoral Training	Liverpool, UK 2017–Current
Pomona College Extra-curricular education – Research Project: “Observational Techniques in Astronomy” – Research Project: “GBR population, an statistical approach”	Claremont, CA, USA 2015–2017
Universidad de Granada Licenciatura (Long Cycle Degree)	Granada, Spain 2009–2015
Katholieke Universiteit Leuven Erasmus Exchange - Master in Astrophysics	Leuven, Belgium 2013–2014

WORKING EXPERIENCE

eDreams Odigeo Placement at Data Science Team	Barcelona, Spain Nov 2019 - May 2020
Pomona College Teaching Assistant	Claremont, CA, USA 2015 - 2017
IES Granada Peer Student Advisor	Granada, Spain 2014 - 2015

PUBLICATIONS

- [1] J. García de la Cruz, M. Martig, I. Minchev, and P. James, “On the Flaring of Thick Discs of Galaxies: Insights from Simulations”, 2020, arXiv: 2012.02741.

TEACHING

- **Teaching Assistant** at University of Liverpool November 2020 - Current
Practical Astrophysics I
- **Teaching Assistant** at University of Liverpool February - May, 2018
Introduction to Astrophysics
- **Instructor / Teaching Assistant** at Pomona College 2015 - 2017
Spanish Conversation Class

SKILLS

- **OS:** Windows, Linux, Mac
- **Programming:** python, SQL, fortran, c++, R, unix, LaTeX
- **Software:** PyRAF, TopCat, Oracle, BigQuery, ORACLE
- **Skill Group:** List of technologies

LANGUAGES

- **English:** fluent
- **Spanish:** native

SEMINARS

- **On the Flaring of Thick Disc of Galaxies** June 2020
Institute of Cosmos Sciences, University of Barcelona

CONFERENCES

- **Linking the Galactic and Extragalactic** Wollongong, NSW, Australia December 2020
Contributed talk
- **European Week of Astronomy and Space Science** Lyon, France June 2019
Contributed talk
- **National Astronomy Meeting** Lancaster, UK June 2019
Contributed talk
- **European Week of Astronomy and Space Science** Liverpool, UK June 2018
Volunteer & Organiser team

WORKSHOPS & SCHOOLS

- LIV.DAT CDT's School on Data Intensive Science October 2020
University of Liverpool, Liverpool, UK
- COST Milky Way Gaia School "Milky Way size galaxy formation and High performance computing" January 2020
ICCUB -IEEC, Barcelona, Spain
- ISSS's Gaia Summer School "Space Astrometry for Astrophysics" June 2019
CIFS, L'Aquila, Italy
- "Weighing Stars from Birth to Death" Workshop November 2018
Lorentz Center, Leiden, Netherlands
- STFC's Summer School in Artificial Intelligence and Machine Learning June 2018
Imperial College, London, UK

- CDT's HPC "High Performance Computing" School June 2018
Imperial College, London, UK
- LIV.DAT CDT's HPC "High Performance Computing" School March 2018
Daresbury Laboratory, Liverpool, UK
- LIV.DAT CDT's HPC "High Performance Computing" School March 2018
Daresbury Laboratory, Liverpool, UK
- OMA school on Monte Carlo simulations November 2017
MPA, Garching, Germany

SCIENCE OUTREACH

- Work Experience Week July 2017 & July 2018
National Schools Observatory, Liverpool, UK
- STFC's Summer School in Artificial Intelligence and Machine Learning June 2018
Imperial College, London, UK
- Astronomical Nights 2006 - 2007
Asociación de Astronomía Hércules, Cádiz, Spain