GISM2 Summer School – Introduction

Frédéric GALLIANO & Karine DEMYK
on behalf of the organizing committee

Banyuls-sur-mer, France

July 25, 2023
Importance of the InterStellar Medium (ISM)

- Galaxy evolution
- Star formation
- Growth of chemical complexity

Historical conundrum

Contemporary open questions

- How to apply knowledge of Galactic ISM to other galaxies?
- Peculiarity of the ISM of the Milky Way?
- Concepts to bridge the gap in angular resolution b/w the Milky Way & external galaxies?
Importance of the InterStellar Medium (ISM)
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- Galaxy evolution
Scientific Motivations – Why Are We Here?

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### Scientific Motivations – Why Are We Here?

#### Importance of the *InterStellar Medium* (ISM)
- Galaxy evolution
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#### Historical conundrum
- \( \text{ISM} \approx \text{Milky Way} \)
- Extragalactic ISM < Intragalactic ISM
  - \( \Rightarrow \) biased point of view

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- ISM $\simeq$ Milky Way
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- Peculiarity of the ISM of the Milky Way?
- Concepts to bridge the gap in angular resolution \(b/w\) the Milky Way \& external galaxies?
Training the next generation of ISMologists

Scientific Motivations – Training Objectives

1. Acquire a holistic knowledge of the field:
   - Observations, models and simulations;
   - Elementary physical processes and how to combine them;
   - What are the open questions.

2. Acquire some technical skills.

3. Create personal links between participants & with speakers:
   - Networking & collaborations;
   - Kick-starting projects;
   - Potential job prospectives.

4. Do not forget to have fun...

F. Galliano & K. Demyk (SOC)

GISM2, Banyuls-sur-mer

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The Audience – Participant’s Current Academic Level

- **PhD student**: 75.0%
- **Master's student**: 18.8%
- **Postdoc**: 6.2%
The Audience – Scientific Interests

- Star formation: 35 participants
- The Milky Way: 13 participants
- Nearby galaxies: 46 participants
- Ionized gas: 20 participants
- Atomic gas: 16 participants
- Molecular gas: 19 participants
- Dust: 18 participants
- Cosmic rays: 5 participants
- Magnetic field: 8 participants
- MHD: 8 participants
- Observations: 31 participants
- Data analysis: 28 participants
- Modeling: 22 participants
- Simulations: 24 participants
The Audience – Coding Experience

Number of participants

- Python: 64
- C/C++: 18
- Julia: 4
- IDL: 7
- Fortran: 10
- Other: 5
## Logistics – The School Program

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F. Galliano & K. Demyk (SOC)  
GISM2, Banyuls-sur-mer  
July 25, 2023
Logistics – The Organizing Committee

Present
Karine DEMYK (hands-on)
Frédéric GALLIANO (chair)
Eva NTORMOUSI (lightning)
Jérôme PETY (Slack, Zoom)
Patrice THEULÉ (kayak, diving)

Excused
Yohan DUBOIS
Annie HUGHES
Eva SCHINNERER

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Yohan DUBOIS  Annie HUGHES  Eva SCHINNERER
Logistics – The Sponsors (2/2)
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Programme National de Cosmologie et Galaxies

Programme national hautes énergies

DAQISM
Goals:

- To teach you a particular set of skills related to the school science
- To create links between students and advisers
- To encourage discussions between participants that could lead to new projects and collaborations
Hands-on – Objectives

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- To teach you a particular set of skills related to the school science
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- Nine projects
- Tutored by speakers, organisers and some school participants
- 4 to 8 students per project
### Hands-on – Break-Out Rooms

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Speaker(s)</th>
<th>Room</th>
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<tbody>
<tr>
<td>P1</td>
<td>Numerical simulations of Shocks and Instabilities Using the RAMSES Code</td>
<td>Eva Ntormousi Pierre Lesaffre</td>
<td>Bât. A room TP1</td>
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<tr>
<td>P2</td>
<td>Cloudy Hans-On : Emission lines</td>
<td>Patrice Theulé</td>
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<td>P3</td>
<td>Cloudy Hans-On : Absorption lines</td>
<td>Hsiao-Wen Chen</td>
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<td>Spectrophotometric Modelling of Galaxies and AGNs</td>
<td>Yannick Roehlly Patrice Theulé Daniel Dale</td>
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<td>P5</td>
<td>The Spatially-Resolved Dust Properties of Nearby Galaxies</td>
<td>Frédéric Galliano Lara Pantoni</td>
<td>Bât. A room TP2</td>
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<td>P6</td>
<td>Millimeter Rotational Lines as Powerful Diagnostics of the Physical Conditions Inside Giant Molecular Cloud - The Orion B case</td>
<td>Jérôme Pety Antoine Zakardjian</td>
<td>Bât. A room TP3</td>
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<td>P7</td>
<td>Combining 1D Models with MULTIGRIS</td>
<td>Vianney Lebouteiller</td>
<td>Bât B. Amphi</td>
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<td>P8</td>
<td>Star-Formation Efficiency &amp; Timescales : Globally to 100 pc Scales</td>
<td>Brent Groves Mélanie Chevance</td>
<td>Bât. A room TP2</td>
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<tr>
<td>P9</td>
<td>Using JWST NIRCAM and MIRI Photometry to Probe the Physical State of PAHs in the ISM of Nearby Galaxies</td>
<td>Karin Sandstrom Jessica Sutter</td>
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Working on the projects:

- Meeting with advisors is only part of the session
- You are supposed to work by ourselves
- Find the best organisation to work: split tasks, work together...

Presentation of the work done:

- Wednesday, August 2, 2:15 - 4:15 pm
- 12 minutes in total, including questions, i.e. $\approx 10$ minutes talk maximum
- The presentation may be made by several team members
- From P1 to P9
- Prepare a pdf file to send in advance