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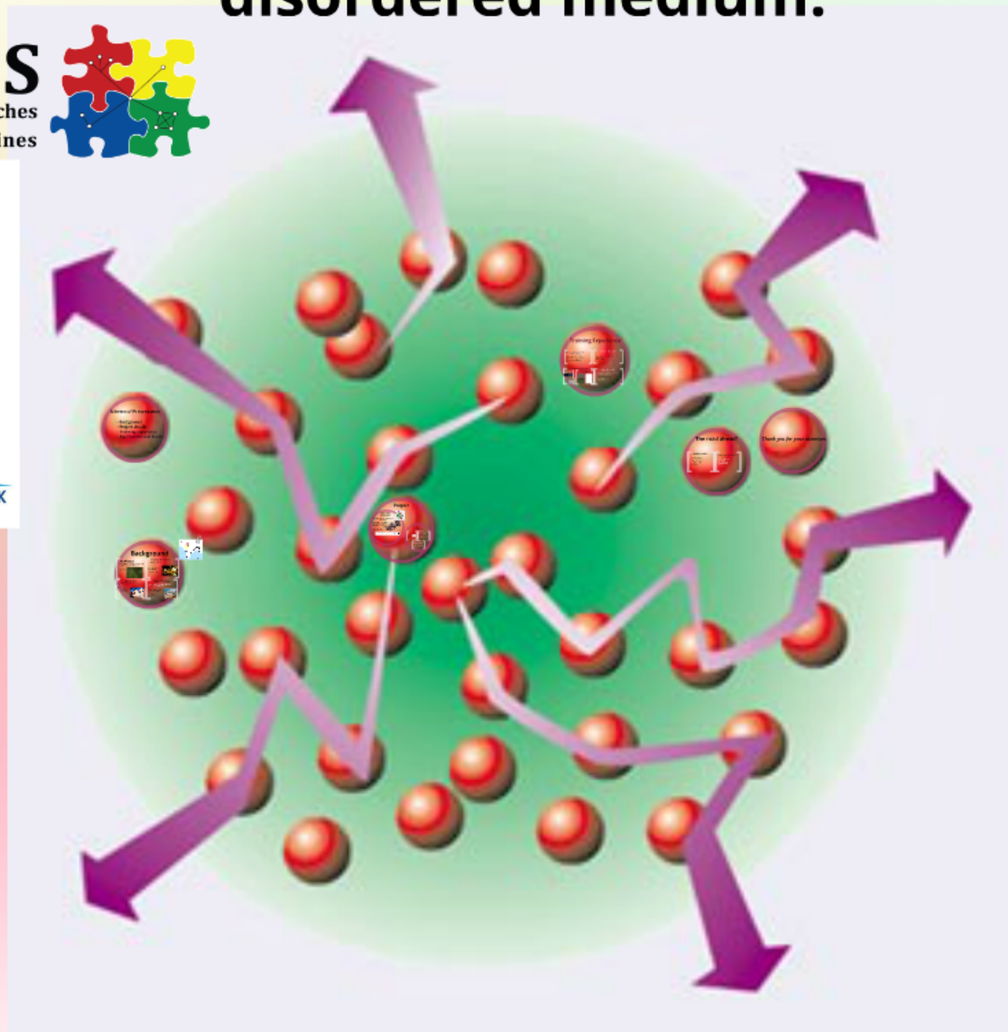

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NETADIS
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SEVENTH FRAMEWORK PROGRAMME

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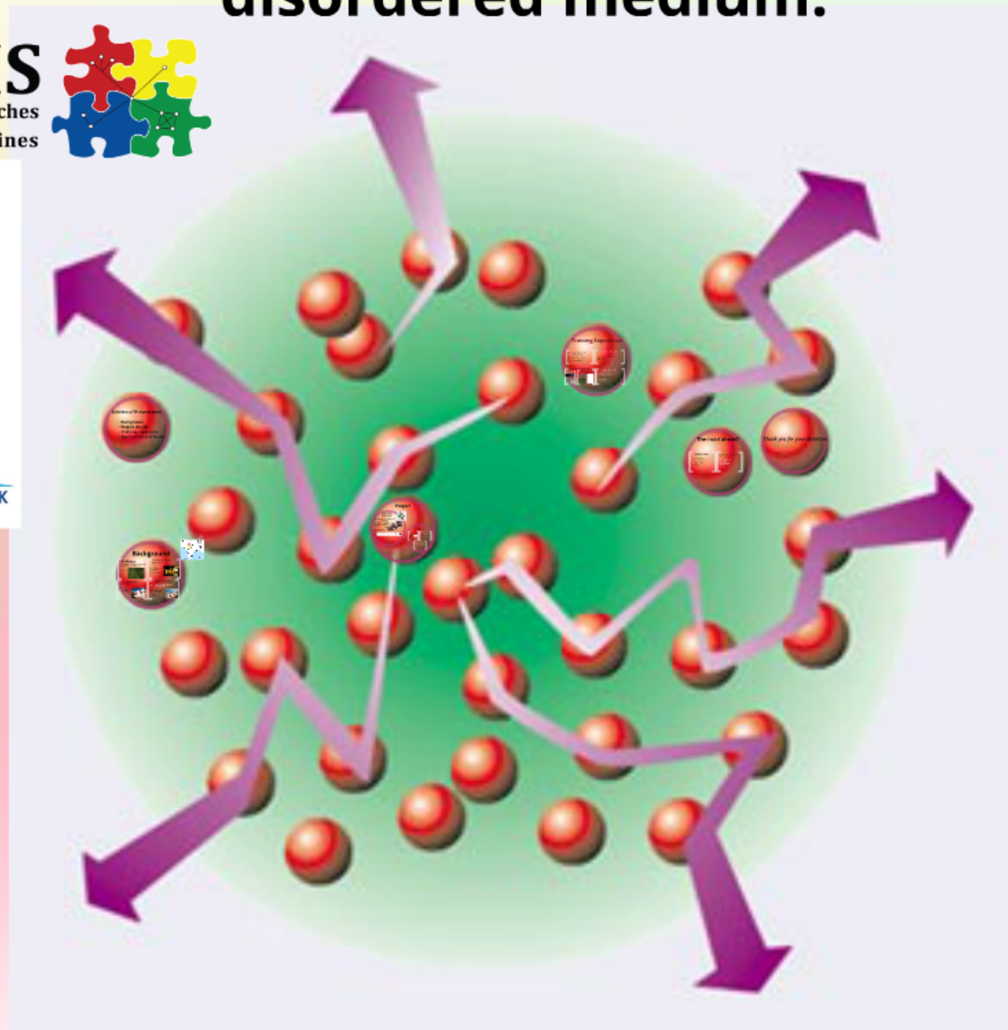

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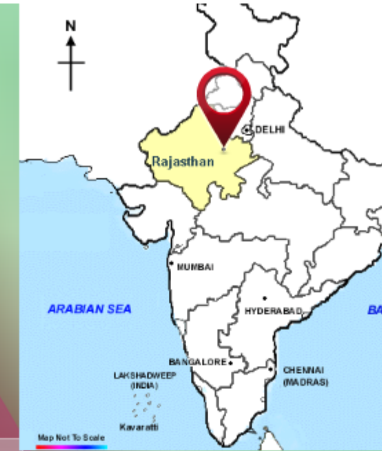
Prezi

Scheme of Presentation

- Background
- Project details
- Training experience
- Applications and future



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2007-10

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starting : Nov 2012

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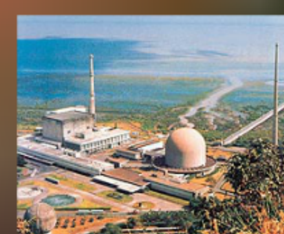

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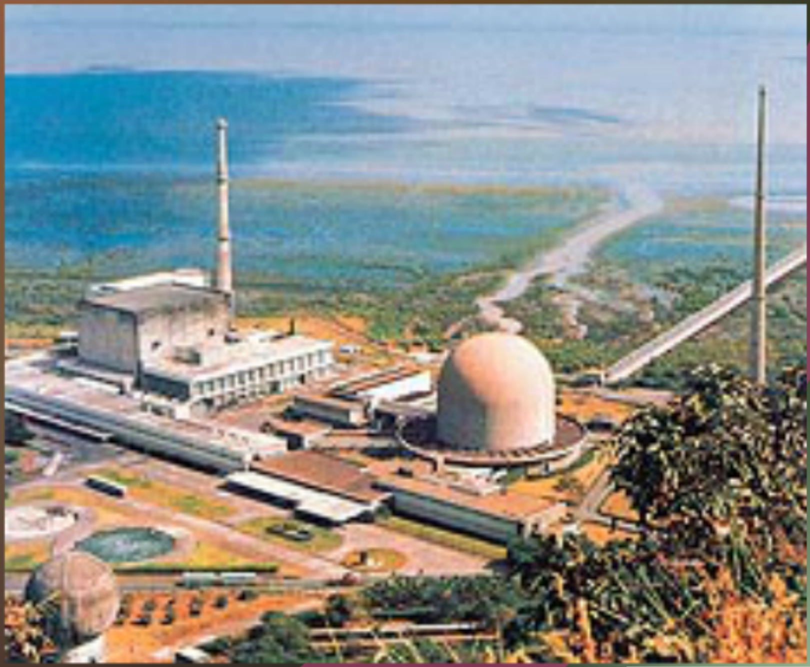

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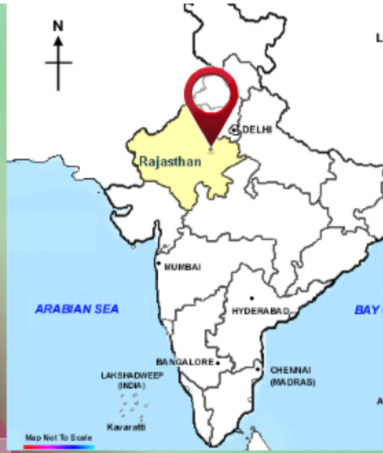

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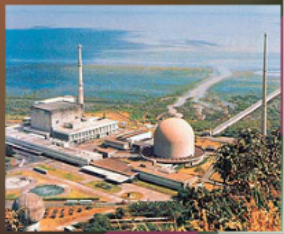

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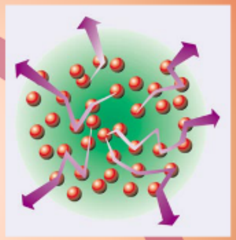
Project

System under consideration



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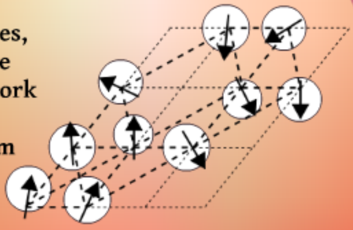
- Spins(conitnous) -> mode phases, mode amplitude
- Graph (various) -> modes network
- Non linear interaction -> laser medium



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Details

Part 1

Various spin glass models :
2-XY and 4-XY model
4 - XORSAT model

Techniques :
- Cavity Method
- Belief Propagation
- Population dynamics

using C/C++/ also optimize using CUDA on GPU's

Expect :
- Characterize phase transitions
  continuous/
  random 1st order phase transition/
  discontinuous with phase coexistence
- Relationship between phase and frequency
- Various thermodynamic variables

Part 2

Statistical inference of interaction couplings
- No complete knowledge of modes (localization and interaction)
- couplings --> representative of spatial interaction or overlap among light modes
- Determine interaction couplings (J)
  using data of magnetisation & Correlation functions
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Also, for experimental data collaboartion with experimental group of Dr. Claudio Conti, UOS di Roma)

Part 3

- MC simulations on various generic graphs from short to long range
- Continuous variables --> CUDA programming on GPU
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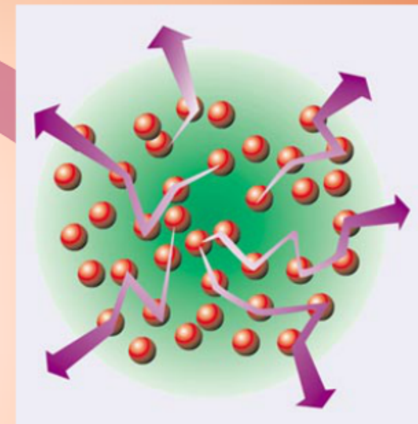

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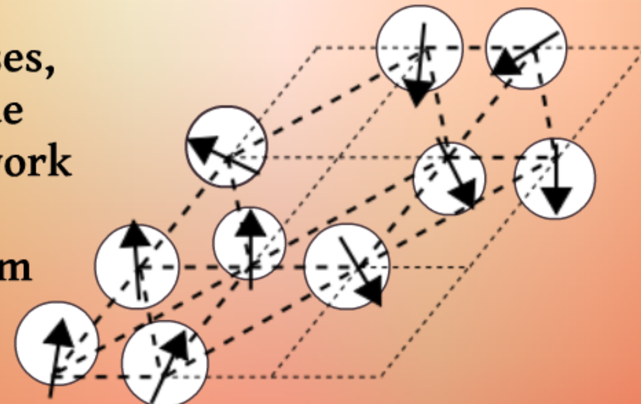

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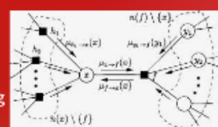

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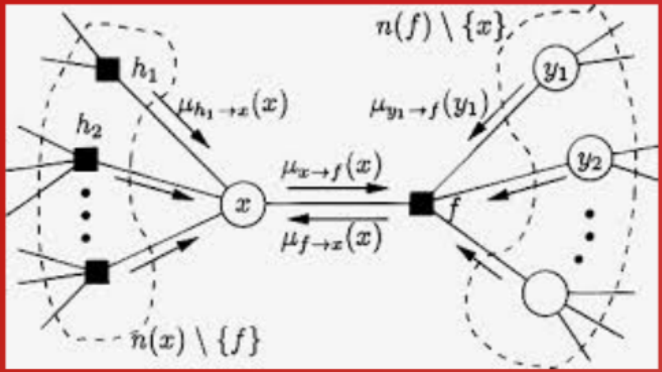

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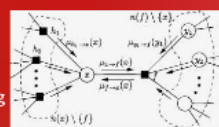

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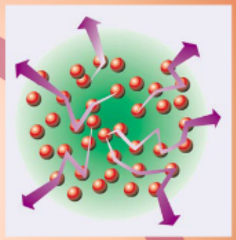

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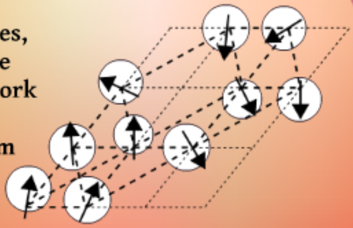

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January 2013 - July 2013

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- Introduction to Information, physics and computation

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Communication skills

- Presentations, seminars and workshops
- Report writing
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- Poster presentation

Advanced schools and training workshops

- Spring College on physics of complex systems,
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Investigating random laser through study of disordered systems.

Payal Tyagi and Luca Leuzzi

IPCF-CNR, Dep. of Physics, Sapienza University of Rome, Piazzale A. Moro 2, I-00185, Rome, Italy

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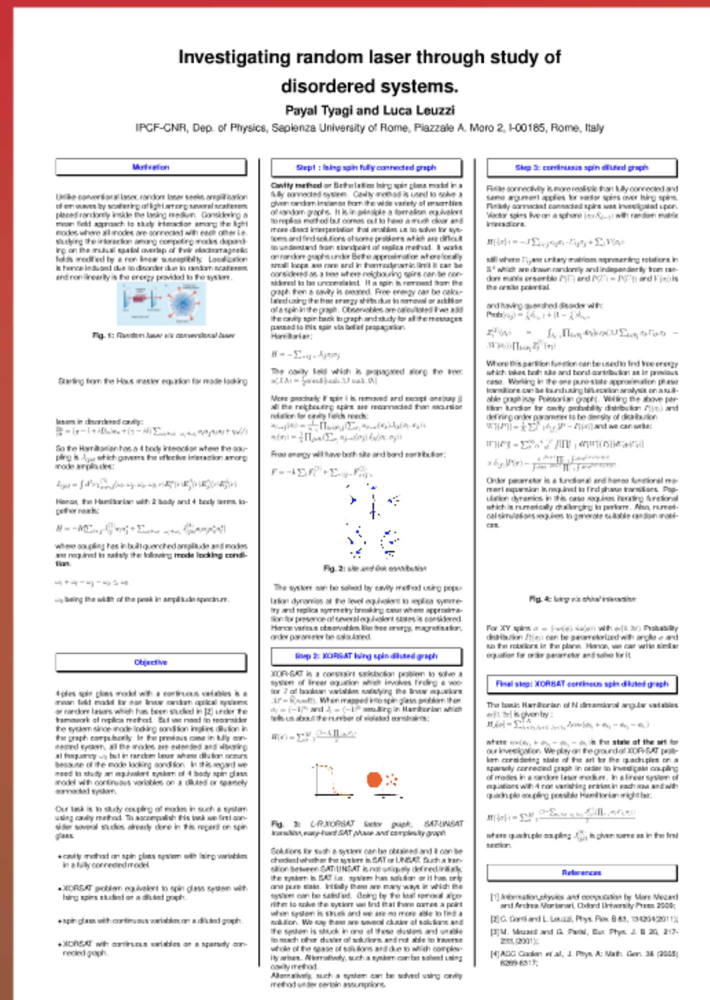

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Prezi

The road ahead!

Applications of RL

- speckle free imaging
- cryptography
- medical diagnostic
- biomedical imaging
- laser paints

Future possibile fields

- GPU computing
- Photonics
- Experimental laser
- Neuroscience
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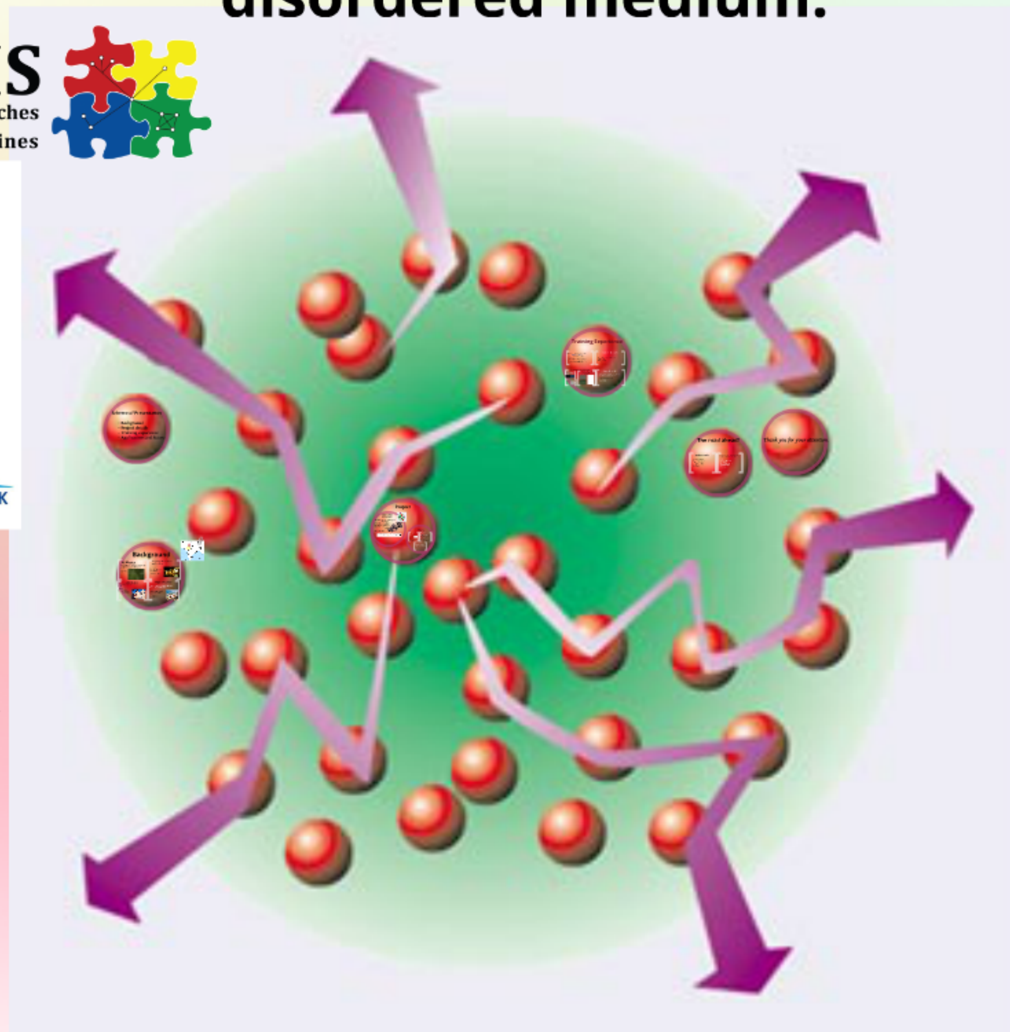

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