



SHORT TERM COURSE ON

## PHASE-ORDERING AND AGING IN PURE AND DISORDERED SYSTEMS

(27 November – 1 December, 2017; at Indian Institute of Technology, Delhi)

### Overview:

There have been important advances in the area of non-equilibrium statistical mechanics in the last few decades. One of these is phase-ordering, which takes place when a system is quenched from the disordered state above the critical point to below it. Due to the sudden change of temperature, the system is put out of equilibrium and initiates to relax by developing domains of the ordered phases, characteristic of the final state. The peculiarity of the process, which makes it a paradigm of slow relaxation, is that these domains grow indefinitely maintaining the system permanently out of equilibrium. The key feature is that the domain linear size defines a natural length scale growing in time. In the asymptotic regime this will dominate all other lengths in the problem generating a rich and interesting phenomenology. This goes under the general heading of dynamical scaling. The course aims to investigate the various manifestations of scaling.

### Objectives:

The primary objectives of the course is to expose participants to some important techniques in non-equilibrium statistical mechanics useful to study complex systems. The latter are ubiquitous, but methodologies to study them are few and far between. There are no advanced text books which contain such topics as yet. The instructor is an expert in the area of non-equilibrium physics. Video recordings and lecture notes will be useful for the statistical physics and condensed matter physics community at large.

<b>Course Contents</b>	<ul style="list-style-type: none"> <li>• General Setting, Slow Relaxation</li> <li>• Dynamical Scaling</li> <li>• Connection correlation–response function</li> <li>• Exact Soluble Pure Models</li> <li>• Numerical Simulations</li> <li>• Disordered Ferromagnets</li> <li>• Out-of-Equilibrium Fluctuation-Dissipation Theorem</li> </ul>	<b>Teaching Faculty</b>	
<b>Who can attend? <sup>1</sup></b>	<ul style="list-style-type: none"> <li>• Masters students interested in pursuing research in theoretical and computational physics.</li> <li>• Graduate students and post-doctoral students working in the areas of statistical physics, condensed matter physics, material science and computational physics.</li> <li>• Researchers working in the areas of statistical physics, condensed matter physics, material science and computational physics.</li> </ul>	<p><b>Marco Zannetti</b> is an Emeritus Professor at the University of Salerno, Italy, working in the field of Non-Equilibrium Statistical Physics. His broad research interests include critical phenomena, dissipative quantum systems, phase ordering, aging in slow relaxation phenomena, fluctuation dissipation relations and other related areas.</p>	
<b>Fees <sup>2</sup></b>	<ul style="list-style-type: none"> <li>• IIT Delhi students and faculty (Free)</li> <li>• Ph.D. and Post Doctoral Fellows from other academic institutes : Rs. 5,000</li> <li>• Faculty from Academic Institutes: Rs. 10,000</li> <li>• Professionals from Industry / Research Organizations: Rs. 15,000</li> <li>• Participants from abroad: USD 500</li> </ul>	<b>Course Coordinator</b>	
<p><b>Varsha Banerjee</b> is a Professor at the Indian Institute of Technology Delhi, working in the field of Non-Equilibrium Statistical Physics. Her research interests include complex spin systems, magnetic nanoparticles for hyperthermia and spintronics, optics with fractal and aperiodic elements, and other related topics.</p>			

Register at <http://www.gian.iitkgp.ac.in> by 10<sup>th</sup> October 2017

Selected candidates will be informed by 12<sup>th</sup> October 2017

Contact: [gianpoapds@gmail.com](mailto:gianpoapds@gmail.com), Manish (+91-88600-87938), Manoj (+91-98915-70546)

<sup>1</sup> Masters, Ph.D and Post Doctoral students need to support their applications with a letter of recommendation sent to [gianpoapds@gmail.com](mailto:gianpoapds@gmail.com). The number of participants from outside IIT Delhi will be limited to twenty.

<sup>2</sup> Fees will be accepted through Demand Draft drawn in favour of "IITD CEP Account" or through e-transfer to IITD CEP ACCOUNTS. The above fee includes all instructional materials, computer and internet use, tea and lunch for the participants. Limited number of accommodation may be available on payment basis. Accommodation requests should be sent to [gianpoapds@gmail.com](mailto:gianpoapds@gmail.com) with subject "Accommodation Request" well in advance.