

Phase Field Simulations: Materials Science meets Biology and Medicine

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Scientific coordination:

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Many systems in our environment are quite far from equilibrium, which is evident for biological cells, but also true for the majority of natural and synthesized materials. Consequently, the emergence of complex patterns on various length scales is responsible for many striking characteristics. The modeling of such nonequilibrium properties has been significantly propelled by the development of the phase field method which allows to simulate the dynamical evolution of the underlying moving boundary problems in an elegant and efficient way. Since its early time, when it was used to understand the fundamentals of phase transitions, spinodal decomposition and solidification, it has now reached a state where e.g. the full microstructure evolution path of complex metallic alloys can be accessed. Today, it is supplemented by the phase field crystal method, which is a promising new approach to incorporate also lattice structures and defects. Moreover, the phase field technique gained popularity in very different fields of physics like soft matter and biophysics, and is there successfully used to describe for example the dynamics of vesicles or the motion of bacteria. In this sense, the phase field technique, which is first of all a methodological approach, revealed many links between very different areas of research, and many developments for specific problems have already stimulated new ways of thinking for others.

The aim of this workshop is to bring together scientists working with the phase field method, with the goal to elaborate the state of the art of this technique and the main scientific directions for future investigations.

Invited speakers:

Tapio Ala-Nissilä (Helsinki)
Gustav Amberg (Stockholm)
W. Craig Carter (Cambridge)
Jaume Casademunt (Barcelona)
Mario Castro (Madrid)
Mowei Cheng (Aachen)
Ken Elder (Oakland)
Roger Folch (Tarragona)

Peter Galenko (Cologne)
Nigel Goldenfeld (Urbana)
Laszlo Granasy (London)
Alain Karma (Boston)
Klaus Kassner (Magdeburg)
Chaouqi Misbah (Saint-Martin d'Hères)
Mathis Plapp (Paris)
Rui Travasso (Lisbon)

Applications for participation and poster contributions are welcome and should be made by using the application form on the workshop web page (please see URL below). The number of attendees is limited. The **registration fee** for the workshop is **50 €** and should be paid by all participants. Costs for accommodation and meals will be covered by the Max Planck Institute. Limited funding is available to partially cover travel expenses. Please note that childcare is available upon request.

Deadline for registration is August 31, 2008.



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