

# Call for papers

## Topical issue on “Cold Quantum Matter – Achievements and Prospects”

Quantum Matter is matter in which all the constituent atoms and molecules are in a single quantum state and behave coherently as a single quantum object. It typically exists at temperatures less than one millionth of a degree above absolute zero. In the long term, quantum matter is expected to have applications in diverse areas ranging from high-precision measurement to quantum information. Ever since the first realization of Bose-Einstein condensation (BEC), which was achieved in an atomic gas in 1995, there have been enormous advances in our ability to produce and manipulate quantum matter. Many completely new physical phenomena have emerged, and the first applications (such as atomic clocks) have been established. The interest in quantum matter is now spreading to other areas, and new phases of matter are emerging in molecular systems and plasmas.

This special issue will focus on recent advances in the diverse areas covered by the ESF Eurocores Network “Cold Quantum Matter EuroQUAM”<sup>1</sup>, which will be concluded in 2010 after three successful years. Following the structure of the network, the topics of the special issue will be oriented along the six Collaborative Research Projects:

- Quantum simulation using cold atoms in optical lattices
- Fermionic mixtures of ultracold atoms
- Collisions of cold polar molecules
- Controlled interactions in quantum gases of metastable atoms
- Cavity-mediated molecular cooling
- Quantum-degenerate dipolar gases of alkali molecules

However, the special issue is not exclusively reserved to these themes but open to all original contributions from experts in the field of Cold Quantum Matter.

Deadline for submission: **January 31, 2011.**

Publication expected: **Fall 2011.**

Contributions are welcome on <https://articlestatus.edpsciences.org/is/epjd/>. When submitting your contribution, please select “Cold Quantum Matter Achievements and Prospects” under the tab for Special Issues. Contributions can also be sent directly to [epjd@edpsciences.org](mailto:epjd@edpsciences.org)

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<sup>1</sup><http://www.esf.org/activities/eurocores/running-programmes/euroquam.html>