

## ESI SENIOR RESEARCH FELLOW LECTURE COURSE Summer Term 2024

The Erwin Schrödinger International Institute for Mathematics and Physics (ESI) of the University of Vienna offers the following Lecture Course held by a Senior Research Fellow in residence during the Summer Term 2024:

**$\Gamma$ -Convergence and Phase Transitions of Heterogeneous Materials**  
**Irene Fonseca** (Carnegie Mellon U)

**Lecture Course (250088 VU): April 11 - 25, 2024**

**Time:** 11:00 - 13:00

**Start:** April 11, 2024

**Further dates:** Friday, April 12, 2024, Tuesday, April 16, 2024, Wednesday April 17, 2024, 11:00 - 13:15

**End:** Thursday, April 25, 2024, 11:00 - 13:15

**Venue:** Erwin Schrödinger Institute, Schrödinger Lecture Hall

**Aim, contents and method of the course:**

The course is intended to provide an invitation to some actual research directions in the calculus of variations, especially in relation with materials science. Variational models and methods for the description of phase change, homogenization, and high-contrast materials will be presented. Variational approximation by Gamma-convergence will be the overarching technical setting.

**Reading list:**

The course will be based on scientific papers, which will be provided at the beginning of the course. As general reference on the subject one can indicate the classical monographs:

1) Dal Maso, Gianni. An introduction to Gamma-convergence. (English summary)

Progress in Nonlinear Differential Equations and their Applications, 8. Birkhäuser Boston, Inc., Boston, MA, 1993.

2) Dacorogna, Bernard. Introduction to the calculus of variations. Third edition. Imperial College Press, London, 2015.

3) Fonseca, Irene; Leoni, Giovanni Modern methods in the calculus of variations:  $L_p$  spaces. Springer Monographs in Mathematics. Springer, New York, 2007.

Course website: <https://www.esi.ac.at/events/e522/>

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Director