PDE Lecture Series:
"Critical Points of Mountain Pass Type with Applications to Elliptic PDE and Material Microstructure Models"

Tuesday 30 November & Wednesday 1 December

Abstracts

Part 1: An Introduction to the Method and Its Applications

Charles Stuart, École Polytechnique Fédérale de Lausanne & OxPDE

Historical remarks leading to the Palais-Smale condition and a basic form of Mountain Pass Theorem. Standard application to super-linear elliptic Dirichlet problem.

Cerami sequences and the Mountain Pass Lemma leading to weaker P-S conditions.
Weaker forms of the mountain pass geometry and a more general mountain pass lemma with localization.
Applications to asymptotically linear and quasilinear Dirichlet problems.

Remarks on Morse index of mountain pass solutions, more general results on linking etc.

Part 2: Applications to Multiwell Quasiconvex Models in Material Microstructure

Kewei Zhang, Swansea University and WIMCS

Quasiconvex/rank-one convex functions, their mountain pass and other critical points, estimates of maximum Morse indices.

A double well quasicovex model in geometrically linear elasticity, quasimonotone gradient, weak PS condition and the mountain pass point.

A two dimensional single elastic well model and the critical point via the homotopic links.

TIMETABLE		
Tuesday 30 November		
12.00 pm - 1.00 pm	Lecture 1 - Charles Stuart	GB First Floor Seminar Room
4.30 pm – 5.30pm	Lecture 2 - Charles Stuart	GB First Floor Seminar Room
Wednesday 1 December		
09.30 am – 10.30 am	Lecture 3 - Charles Stuart	GB First Floor Seminar Room
11.00 am – 12.00 pm	Lecture 4 - Charles Stuart	GB First Floor Seminar Room
2.00 pm – 3.00 pm	Lecture 5 - Kewei Zhang	GB First Floor Seminar Room
3.30 pm – 4.30 pm	Lecture 6 - Kewei Zhang	GB First Floor Seminar Room