The Riemann International School of Mathematics (RISM) in collaboration with Università degli Studi dell'Insubria and Centro de Matemática, Applicaçòes Fundamentais e Investigação Operacional, organizes the Workshop

Advances and Challenges in Nonlinear Elliptic Systems (ACNES 2019)

February 7-8th, Villa Toeplitz, Varese

Thursday 7th

14.20 – 14.30	Opening at the presence of the Deputy Rector of the University of Insubria Prof. S. Serra Capizzano.
14.30 – 15.10	**Ivar Ekeland**, "A new approach to regularity theory for elliptic equations".
15:15 – 15:55	**Susanna Terracini,** "Liouville theorems and uniform regularity estimates for a class of degenerate/singular elliptic operators".
16.00 – 16.30	**Break**
16.30 – 17.10	**Boyan Sirakov,**"On a priori bounds for positive solutions of elliptic PDE". Abstract. We review some recent methods for proving that positive solutions of superlinear uniformly elliptic PDE are uniformly bounded. For instance, positive solutions of the Lane-Emden equation in a two-dimensional smooth bounded domain are uniformly bounded for all large exponents.
17.15 – 17.55	**Isabella Ianni**, "Asymptotic analysis, Morse index and uniqueness of positive solutions of the Lane-Emden problem in planar domains".
18.00 – 18.40	**Alessio Pomponio**, "The Born-Infeld equation: solutions and equilibrium measures".
20.15	**Social Dinner at Restaurant "Il Gestore"** **http://www.ristoranteilgestore.com/**

09.00 – 9.40	**Patrizia Pucci,** "Some nonlinear problems with lack of compactness: new results and open questions". Abstract. The first part of the talk deals with the existence of nontrivial entire solutions for critical Hardy quasilinear systems driven by general (p,q) elliptic operators of Marcellini types. Existence is derived as an application of the mountain pass geometry and the concentration-compactness principle of Lions. The constructed solution has both components nontrivial, that is it solves the actual system, which does not reduce into an equation. In the second part we present new results on existence of solutions for degenerate Kirchhoff problems, involving (p,q)-fractional operators as well as critical nonlinearities. The results improve or complement previous theorems for the quasilinear (p,q) scalar as well as vectorial problems. The conclusions also raise, and leave open, a number of other intriguing questions, which are briefly presented.
09.45 – 10.25	**Vieri Benci**, "Multibump solutions for an elliptic system".
10.30 –11.00	**Break**
11.00–11.40	**Jianjun Zhang**, "Positive solutions of weakly coupled systems with critical growth in dimension two". Abstract. In this talk, we are concerned with positive vector solutions of Bose-Einstein type systems in dimension two. The interaction is of critical exponential type in the sense of J. Moser. We prove, using variational methods, the existence of positive vector ground state solutions both in the attractive and repulsive cases.
11.45–12.25	**Tobias Weth**, "On Schrödinger-Poisson type systems in the plane". Abstract. I will report on some recent results - obtained in joint work with Silvia Cingolani and Miao Du - on planar elliptic systems of Schrödinger-Poisson type. These systems can be reduced to scalar equations with a nonlocal nonlinearity involving the convolution with a logarithmic kernel function. Due to the presence of this kernel, the variational structure of the reduced equations differs substantially from the corresponding one in the higher dimensional case and presents some interesting and somewhat surprising features.
12.30	**Social lunch in villa**