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Dynamische Systeme

Organised by
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Abstract. This workshop continued the biannual series at Oberwolfach on Dynamical Systems that started as the "Moser-Zehnder meeting" in 1981. The main themes of the workshop are the new results and developments in the area of dynamical systems, in particular in Hamiltonian systems and symplectic geometry related to Hamiltonian dynamics. Highlights were the solution of a fifty year old problem in Arnold diffusion and a KAM-result on quasi-linear perturbations of the KdV-equation.

Mathematics Subject Classification (2010): 37, 35, 53D.

Introduction by the Organisers

The workshop was organized by H. Eliasson (Paris), H. Hofer (Princeton) and J.-C. Yoccoz (Paris). It was attended by more than 50 participants from 11 countries and covered a large area of dynamical systems centered around classical Hamiltonian dynamics: KAM theory, Arnold diffusion, geodesic flows, periodic solutions of symplectic flows, Floer homology. Other subjects treated where dynamics of PDEs, magnetic fields, quasi-periodic co-cycles and Schrödinger operators, pseudo-rotations, Teichmuller dynamics, pentagram maps, discrete bicycle transformations, group actions and algebraic number theory.

C-Q Cheng and by V. Kaloshin presented their proofs of existence of Arnold diffusion in "generic" nearly integrable Hamiltonian systems in $2\frac{1}{2}$ degrees of freedom. This is a fifty year old problem to whose solution many mathematicians, in particular J. Mather, have contributed.

M. Berti presented a perturbation result of KAM-type for quasi-linear perturbations of the KdV equation. Quasi-linear perturbations are particularly important

for the connection of KdV with water wave equations whose perturbation theory is one of the most challenging problem in the KAM-theory for PDE's. M. Guardia reported on growth of Sobolev norms for the non-linear cubic Schrödinger equation and L.-S. Young discussed a work on center manifolds and chaotic dynamics in infinite dimension with applications to certain PDE's.

A. Abbondandolo presented new results on the old problem of periodic solutions in magnetic fields. V. Ginzburg P. Albers and U. Hryniewicz discussed pseudo holomorphic curve and Floer homology methods in symplectic and contact dynamics. M.-C. Arnaud reported on a generalization of the (former) Hopf conjecture to Tonelli Hamiltonians.

Pseudo-rotations were discussed by B. Bramhan and P. Le Calvez and also in the talk of J. Franks on Tits alternative for symplectic surface diffeomorphisms. New results on reducibility and Lyapunov exponents for quasi-periodic co-cycles were presented by N. Karaliolios, K. Bjerklöv and J. You. Teichmuller dynamics was discussed in the talks of C. Matheus Silva Santos and C. Ulcigrai.

The meeting was held in an informal and stimulating atmosphere. The weather was very nice the whole week and the traditional walk to St. Roman, this year under the leadership of Sergei Tabachnikov, was even more pleasant than usual.

Workshop: Dynamische Systeme

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