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CURRICULUM VITAE

Giovanni Forni

Giovanni Forni received his undergraduate degree in Mathematics (Laurea) from University of Bologna in 1989. He did his graduate studies at Princeton University where he received his Ph. D. in Mathematics in 1993 with a thesis on the dynamics of twist maps of the annulus written under the supervision of Prof. J. N. Mather.

After his Ph.D., he held a position at the University of Bologna as a "Ricercatore" (1993-1996). After one year in Bologna, having been awarded a Newton Fellowship of the European Union, he spent two years at the Newton Institute in Cambridge, UK (1994-1996). In 1996 he came back to the US as an Assistant Professor at Princeton University, position which he held from 1996 to 2001. He then moved to Northwestern University as an Associate Professor (2001-2005) and subsequently to the University of Toronto as a Professor and Canada Research Chair (2005-2007). Recently he has joined the University of Maryland at College Park. While at Northwestern he has spent one academic year (2003/2004) on leave as a Professor at the University of Paris-Sud at Orsay, France.

Forni has been invited speaker to a number of International Conferences and Workshops. In 2001 he delivered the first *Salomon Bochner Lectures* in Mathematics at Rice University. In 2002 he was invited to speak at the 2002 *International Congress of Mathematicians* in Beijing, China (in the session: ODE and Dynamical Systems). He has also been invited to deliver a Plenary Talk at the *AMS Sectional Meeting* in Boulder, CO (2003). Other invitations to speak include the *International Conference on Dynamical Systems* in honor of J. Palis held at IMPA in Rio de Janeiro, Brazil, in 2000, the conference *Progress in PDE*, held in Edinburgh, UK, in 2001, the conference *Equadiff*, held in Hasselt, Belgium, in 2003, the conference *Chaos and Disorder in Mathematics and Physics* in honor of Ya. Sinai, held in Bressanone, Italy, in 2005. He has also participated and delivered talks at several regular meetings in Dynamical Systems such as the annual *Workhshop in Dynamical Systems and Related Topics* held at Pennsylvania State University, the bi-annual meeting *Dynamische Systeme* held in Oberwolfach, Germany.

Besides the Newton Fellowship mentioned above, Forni has been the recipient of a Sloan Research Fellowship (2000-2002), of an NSF Focused Research Grant on *Rational Billiards and geometry and dynamics on Teichmuller space* (2003-2006), of a Canadian NSERC Grant (2006-2011) and most recently of an NSF Grant on *Parabolic Dynamics* (2008-2011).

Forni first research interest was in the field of several complex variables, in particular the topology of analytic spaces. He continued studying several complex variables during his first graduate years at Princeton attending courses of J. Kohn and C. Fefferman. He decided to do his graduate work in dynamical systems after studying some of J. N. Mather's work on twist maps of the annulus. In his thesis Forni proved a real analytic version of M. Herman's and Mather's theorems on destruction of invariant curves of twist maps under small perturbation. Through his thesis work, Forni became interested in smooth stability problems from the point of view of Kolmogorov-Arnold-Moser theory. Looking for non-standard examples of smooth stability with finite codimension he started working on the

cohomological equation for conservative flows on higher genus surfaces and discovered the existence of distributional obtructions to the existence of smooth solutions.

In the summer of 1995, Forni met A. Zorich in Oberwolfach and learned of the Kontsevich-Zorich conjectures on the deviation of ergodic averages for interval exchange transformations. He conjectured that invariant distributions could play a role in the Kontsevich-Zorich picture. This conjecture led him to the study of the dynamics of the Teichmüller flow on the moduli space of abelian differentials on Riemann surfaces. In the winter of 1995, Forni visited Penn State University and learned that A. Katok had done (unpublished) work on invariant distributions for horocycle flows. A few years later, after completing the proof of a substantial part of the Kontsevich-Zorich conjectures, Forni teamed up with L. Flaminio with the project of extending the Kontsevich-Zorich picture to certain homogeneous flows, in particular horocycle flows and nilflows. The joint work of Flaminio and Forni contains results on cohomological equations for $SL(2, \mathbf{R})$ unipotent flows and for general nilflows, as well as refined results on the asymptotic of ergodic averages for horocycle flows and Heisenberg nilflows.

Forni current research is focused on the dynamics of rational polygonal billiards and of nilflows on higher step nilmanifolds. He would like to extend to rational billiards his results on deviation of ergodic averages and his joint result with A. Avila on weak mixing for typical translation flows on higher genus surfaces. In a recent joint paper with J. Athreya, Forni has obtained a power-law upper bound on the deviation of ergodic averages for rational billiard, which is a step in the direction of the proof of Kontsevich-Zorich picture for billiards. The goal of his current research on nilflows, in collaboration with L. Flaminio, is to prove bounds on the speed of ergodicity for higher step nilflows.