1015-35-193 **Daniela De Silva** (desilva@math.jhu.edu), Department of Mathematics, Johns Hopkins University, Baltimore, MD 21218, **Natasa Pavlovic*** (natasa@math.princeton.edu), Department of Mathematics, Princeton University, Princeton, NJ 08544-1000, **Gigliola Staffilani** (gigliola@math.mit.edu), Department of Mathematics, Massachusetts Institute of Technology, Cambridge, MA 02139-4307, and **Nikolaos Tzirakis** (tzirakis@math.toronto.edu), Department of Mathematics, University of Toronto, Toronto, Ontario M5S 2E4, Canada. *Global well-posedness for the 1D quintic nonlinear Schrödinger equation on the torus.*

In this talk we will present a joint work with Daniela De Silva, Gigliola Staffilani and Nikolaos Tzirakis on global well-posedness for the L^2 critical Schrödinger equation with periodic boundary conditions in 1D. By combining an implementation of the method of almost conservation laws with elementary number theoretic techniques we prove that the problem is globally well-posed in the Sobolev space $H^s(\mathbb{T})$, for any $s > 4/9$.

The main difficulty in obtaining global well-posedness results in the periodic context is the absence of a quantitative refinement of the bilinear Strichartz's estimate. In order to overcome the non-availability of a quantitative refined Strichartz's estimate, we exploit the scaling symmetry of the equation and analyze the initial value problem on $\mathbb{T}_\lambda \times \mathbb{R}$ where $\mathbb{T}_\lambda = \mathbb{R}/\lambda\mathbb{Z}$. The main novelty in this analysis consists in establishing a bilinear Strichartz's inequality for λ-periodic functions which are well separated in frequency space. The constant in the inequality is quantified in terms of λ. As $\lambda \to \infty$, our estimate reduces to the refined bilinear Strichartz's inequality on $\mathbb{R}$. (Received February 05, 2006)