Schedule

Clay Mathematics Institute

Clay Research Conference

Andrew Wiles Building

University of Oxford

1 October 2014

9:30 **Jonathan Pila**, *The Schanuel paradigm*
   (Introduced by Boris Zilber)

10:30 Coffee

11:00 **Scott Sheffield**, *Chinese dragons and mating trees*
   (Introduced by Martin Hairer)

14:00 **Paul Seidel**, *Steenrod squares and symplectic fixed points* (Introduced by Dusa McDuff)

15:00 Tea

15:30 **Ben Green,** *Higher-order Fourier analysis and applications* (Introduced by Andrew Wiles)

16:30 Landon Clay will present a Clay Research Award to Peter Scholze. Michael Rapoport will speak on Scholze's work

17:00 Reception

Jonathan Pila (Oxford). Pila's research straddles logic and number theory. In 2011 he was given a Clay Research Award for his work on the André-Oort conjecture concerning sets of special points on Shimura varieties. He proved the conjecture in the case of products of modular curves by using a combination of techniques from analytic geometry and the theory of o-minimal structures in mathematical logic. He was also awarded the Senior Whitehead Prize of the London Mathematical Society for this work. In 2013, he shared the Karp Prize of the Association for Symbolic Logic.

In August this year, he gave a plenary lecture at the ICM in Seoul on *O-minimality and Diophantine Geometry.*

Scott Sheffield (MIT). Sheffield's research covers probability, mathematical physics and game theory. In 2006, he was awarded the Rollo Davidson Prize for 'his work on spatial models of probability theory and especially their relationship to stochastic (Schramm) Loewner evolutions'. In 2011, he won Loève Prize, which recognizes outstanding contribution by young researchers in Probability. The citation covered his work on Schramm-Loewner evolution and various developments from it. It also mentions contributions in 'two quite separate fields. The first involves dimer models, spanning trees, and tilings; the second involves game theory, PDEs, and Lipschitz extension theory'.

He was an invited speaker at the ICM in Hyderabad in 2010.

Paul Seidel (MIT). Seidel's research focuses on symplectic topology, mirror symmetry, homological algebra and string theory. As a graduate student, he studied at Oxford under the supervision of Simon Donaldson, and wrote a DPhil thesis on *Floer Homology and the symplectic isotopy problem.* In 2010, he was awarded an Oswald Veblen Prize in Geometry for 'his fundamental contributions to symplectic geometry and, in particular, for his development of

advanced algebraic methods for computation of symplectic invariants'. He was awarded a European Mathematical Society Prize at the European Congress of Mathematics in 2000. In 2010 he became a Fellow of the American Mathematical Society and in 2014 a member of the American Academy of Arts and Sciences.

He was an invited speaker at the ICM in Beijing in 2002.

Ben Green (Oxford). Green's research focuses on prime numbers, using a combination of techniques from analysis, combinatorics and number theory. In 2004, he proved, with Terence Tao, the Green-Tao theorem that for all $n,$ there exist infinitely many arithmetic progressions of prime numbers of length $n.$ He was awarded the 2005 Ostroski Prize, jointly with Tao, for this work. The citation also mentioned his proof of the Cameron-Erdős Conjecture. He was given a Clay Research Award in 2004 and was a Clay Research Fellow in 2006-7. In 2007, he won the SASTRA Ramanujan Prize, and in 2008, one of the European Mathematical Society Prizes. He was elected a Fellow of the Royal Society in 2010.

In August this year, he gave a plenary lecture at the ICM in Seoul on *Approximate algebraic structure.*

Research Award. Peter Scholze will be presented with one of the two 2014 Clay Research Awards in recognition of his many and significant contributions to arithmetic algebraic geometry, particularly in the development and applications of the theory of perfectoid spaces. Michael Rapoport, Professor of Arithmetic Algebraic Geometry at the University of Bonn, will speak about Scholze's work. Scholze is currently a Clay Research Fellow, and works at the University of Bonn.

The second award, to Maryam Mirzakhani (Stanford), will be presented at a later date. Mirzakhani was a Clay Research Fellow from 2004 to 2008. She won a Fields Medal this summer.