ASPECTS of Topology

17-19 December 2012, Oxford

	MONDAY	TUESDAY	WEDNESDAY
09:30		*Registration*	
10:00		**Gregory Moore**	**David Ben-Zvi**
11:00		*Coffee*	*Coffee*
11:30		**Kevin Costello**	**Soren Galatius**
12:30		*Lunch*	*Lunch*
15:00	*Registration*	**Constantin Teleman**	**Dan Freed**
16:00	*Tea*	*Tea*	*Tea*
16:30	**Michael Hopkins**	**Nigel Hitchin**	**Dennis Sullivan**
	Reception		*Exhibition: Old Library* *Reception: Savile Room* *Conference Dinner: Merton Hall*

All lectures will take place in the Mathematical Institute, St Giles Street.

The audience of the Astor Lecture is invited to a reception in the Common Room of the Mathematical Institute immediately after the lecture, 17:30-19:00. The reception is sponsored by OUP.

On Wednesday evening the Old Library at Merton College will be open 18:00-19:20 for participants. This is the oldest purpose built library in England. Merton has a long tradition in mathematics and was one of the international centres in the Middle Ages. The librarian has selected a few items of mathematical interest for display.

There will be a reception in the Savile Room from 19:00 before dinner in Hall at 19:30.

ASTOR LECTURE

Monday 16:30-17:30
Michael Hopkins
Title: The homotopy groups of spheres
Abstract: I will describe the history of the homotopy groups of spheres, and some of the many different roles they have come to play in mathematics.

TUESDAY MORNING
Chair: John Greenlees

10:00-11:00
Gregory Moore
Title: Operads in the infrared

11:30-12:30
Kevin Costello
Title: Quantum field theory and quantum groups
Abstract: In the 1980s and 90s, a beautiful circle of ideas was developed (by Graeme, among others) relating loop groups, quantum groups, and Chern-Simons field theory. In this lecture I'll explain a four-dimensional version of part of this story: I'll show how certain twisted supersymmetric gauge theories are "controlled" by Yangians (which are infinite-dimensional quantum groups), in the same way that the ordinary quantum group controls Chern-Simons theory. Along the way, I'll say a little about what I mean by a field theory (needless to say, the axioms I'll use owe a great deal to Graeme); and I'll sketch a first-principles derivation of the relationship between the Chern-Simons field theory and the quantum group.

TUESDAY AFTERNOON
Chair: Tom Bridgeland

15:00-16:00
Constantin Teleman
Title: Langlands duality in 2-dimensional gauge theory

16:30-17:30
Nigel Hitchin
Title: A line bundle in hyperkähler geometry

WEDNESDAY MORNING
Chair: Ivan Smith

10:00-11:00
David Ben-Zvi
Title: Loops, characters and elliptic curves
Abstract: I will describe joint work with David Nadler (and in parts with David Helm, Sam Gunningham and Anatoly Preygel) exploring some variations on themes by Graeme Segal, relating representations of loop groups, quantum field theory and elliptic curves. Our main object of study is the category of "elliptic character sheaves". This category can be viewed as a categorified Verlinde algebra, housing characters for categorical representations of loop groups. It forms part of an extended three dimensional topological field theory, with close ties to geometry of character varieties of surfaces. I will explain how elliptic character sheaves provide a natural setting for a variety of phenomena in representation theory, including affine Springer theory, unipotent representations of p-adic groups, the geometric Arthur-Selberg trace formula, and the geometric Langlands program in genus one.

11:30-12:30
Soren Galatius
Title: Moduli spaces of high dimensional manifolds
Abstract: I will discuss recent joint work with O. Randal-Williams, on the cohomology of higher-dimensional analogues of the moduli space of Riemann surfaces.

WEDNESDAY AFTERNOON
Chair: Elmer Rees

15:00-16:00
Dan Freed
Title: 4-3-2-8-7-6

16:30-17:30
Dennis Sullivan
Title: Graeme's work and stratified string topology
Abstract: Using Graeme's classifying spaces of categories one can relate transversal open strings on a knot to the geometrisation of the complement.
