

# The 2014 Alfred Brauer Lectures

## **SIMON DONALDSON**

Simons Centre

### **“Canonical Kähler metrics and algebraic geometry”**

The theme of the lectures will be the question of existence of preferred Kähler metrics on algebraic manifolds (extremal, constant scalar curvature or Kähler-Einstein metrics, depending on the context).

#### **LECTURE 1: Geometry of Kähler metrics**

Monday, March 24, 2014 from 3:30 – 4:30\*

Phillips Hall, Room 215

#### **LECTURE 2: Toric surfaces**

Tuesday, March 25, 2014 from 4:00 – 5:00

Phillips Hall, Room 215

#### **LECTURE 3: Kähler-Einstein metrics on Fano manifolds**

Wednesday, March 26, 2014 from 4:00 – 5:00

Phillips Hall, Room 215

\*There will be a reception in the Mathematics Faculty/Student Lounge on the third floor of Phillips Hall, Room 330, 4:45—6:00 pm, on Monday, March 24. Refreshments will be available there at 3:30 before the second and third lectures.

# The Alfred Brauer Lectures 2014

Professor Simon Kirwan Donaldson, of Simons Centre, will deliver the 2014 Alfred Brauer Lectures in Mathematics. Professor Donaldson's lectures are entitled "Canonical Kähler metric and algebraic geometry"; an abstract can be found on the Mathematics Department's website: [www.math.unc.edu](http://www.math.unc.edu). The first lecture will be on Monday, March 24 from 3:30 to 4:30 pm in Phillips Hall Rm. 215. It will be followed by a reception at 4:45 pm in Phillips Hall 330. The second and third lectures will be on Tuesday, March 25 and Wednesday, March 26 from 4:00 to 5:00 in Phillips Rm. 215.

Professor Donaldson became internationally famous with his 1983 D. Phil. thesis "The Yang-Mills equations over Kähler manifolds," which proved stunning new results about distinguishing differentiable structures on four-manifolds. This seminal work revolutionized the approach to geometry in dimension four, and led to his receiving the Fields Medal in 1986 (before he reached the age of 30) at the International Congress of Mathematicians in Berkeley. Through articles, books, and over 40 thesis students, he has influenced complex and symplectic geometry, in particular with recent work on Kähler metrics on manifolds, the topic of his Brauer Lectures.

A student of Sir Michael Atiyah and Nigel Hitchin, Donaldson became the Wallis Professor of Mathematics at Oxford in 1985. He later held professorships at Stanford University and Imperial College, London, and has been at the Simons Centre since January 2014. Besides his Fields Medal, Donaldson has among other honors won or shared the Crafoord Prize, Polya Prize, King Faisal Prize, and Shaw Prize. A Fellow of the Royal Society since 1986, he is also a Foreign Associate Member of the US National Academy of Sciences and the French Académie des Sciences. In 2012 his career was recognized with a knighthood from Queen Elizabeth. Donaldson is a longtime editor for the Journal of Differential Geometry and the Duke Mathematical Journal.

Alfred Brauer (1894—1985) had a profound impact on the Mathematics Department at the University of North Carolina. Born in Germany, he held a position at the University of Berlin until the advent of the Nazis during the 1930's; he fled the country in 1939, accepting Hermann Weyl's invitation to the Institute for Advanced Study in Princeton. He came to North Carolina in 1942 and taught here until his retirement in 1966. During this time he founded the Mathematics and Physics Library, using his knowledge and expertise to establish a superb collection. In appreciation for this effort the Library was named for him in 1976. Alfred Brauer was honored by the University with the award of a Kenan Professorship in 1959, the Tanner Award for excellence in undergraduate teaching in 1965, and an honorary Doctor of Legal Letters degree in 1972. He also received honors from outside the University, including the Oak Ridge Science Award and the G.W.F. Hegel Medal from the University of Berlin. In 1975 an Alfred T. Brauer Instructorship was created at Wake Forest University, where he taught after his retirement from UNC.

The Alfred Brauer Fund was established by the Department of Mathematics in 1984 on the occasion of Dr. Brauer's ninetieth birthday, and the Alfred Brauer Lectures began in 1985. The most recent Brauer Lecturers have been Peter Sarnak, János Kollár, Andrew Majda, Jeff Cheeger, Shing-Tung Yau, Percy Deift, Charles Fefferman, Claire Voisin, Alex Eskin, Gérard Laumon, Alexander Lubotzky, and Vaughan Jones.