

## SUMMER SCHOOL

### UNDERSTANDING STRATIFIED SPACES FROM AN ANALYTIC AND TOPOLOGICAL VIEWPOINT

Humboldt-Universität Berlin, Institut für Mathematik,  
Aug. 4 – 8, 2014

Organizers: Markus Banagl (Heidelberg), Jochen Brüning (HU Berlin)

#### PROGRAM

The schedule consists of two lecture courses and 4 exercise sessions.

	Mon	Tue	Wed	Thu
9:15 – 10:45	Banagl L1	Brüning L2	Banagl L3	Brüning L4
13:15 – 14:45	Brüning L1	Banagl L2	Brüning L3	Banagl L4
16:00 – 18:00	Exercise	Exercise		Exercise

On Fr. Aug. 8, we finish at 16:30 to allow for return travel. Thus the schedule for Fr. is: 9:00 – 10:30 Banagl, 11:00 – 12:30 Brüning, 14:00 – 16:30 exercises.

#### **Course 1:** *Topological Invariants of Stratified Spaces*

*Lecturer:* Banagl

*Topics:* Stratification theory, pseudomanifolds, and intersection cohomology; Relation to Cheeger's  $L^2$ -Cohomology; The Witt condition (topologically), the signature, and singular bordism theories; characteristic classes for singular spaces; Intersection spaces and the scattering metric; Applications: flatness, equivariant cohomology, algebraic geometry and mirror symmetry,  $L$ -Theory and the stratified Novikov conjecture.

#### **Course 2:** *Spectral Invariants*

*Lecturer:* Brüning

*Topics:* Review of the de Rham-Hodge operator and spectral theory on compact oriented manifolds (as model); Hilbert complexes, Simplicial complexes (as illustration), Cheeger's results; Whitney spaces (in the sense of Mather), examples; Condition (b) and the equivalent version of Thom-Trotman; Abstract Whitney spaces (in the sense of Mather) or Thom-Mather stratified spaces; The double of an abstract Whitney space with boundary; Whitney embeddings of abstract Whitney spaces; Conic metrics; The Witt condition (analytically); The resolvent construction on Whitney spaces with applications.

**Location:** Erwin Schrödinger-Zentrum, Rudower Chaussee 26, 12489 Berlin (Adlershof), 0'307 (ground floor).