

International Mathematical Summer School for Students 2011

Tentative Program

Saturday 2	<i>Arrival</i>				
Sunday 3	<i>Opening in the Campus Center 10:00–12:00</i>				
Afternoon	14:00–15:15	15:45–17:00	17:30–18:45	until 20:00	
Research II	Conway	Hubbard	Tabachnikov	<i>Dinner extended</i>	
Monday 4	9:30–10:45	11:15–12:30	15:00–16:15	16:45–18:00	19:30–21:30
Research II	Ghys	Conway	Hubbard	Tokieda	<i>The Free Will</i>
Tuesday 5	9:30–10:45	11:15–12:30	15:00–16:15	depart 16:40	depart 19:30
Research II	Matveev	Schleicher	Conway	<i>Downtown</i>	<i>Cruise Ship</i>
Research III			Tabachnikov	<i>Bremen</i>	<i>from “Schlachte”</i>
Wednesday 6	9:30–10:45	11:15–12:30	15:00–16:15	16:45–18:00	
Research II	Andler	Conway	Hubbard	Ghys	
Research III		Tabachnikov	Matveev	Tokieda	
Thursday 7	9:30–10:45	11:15–12:30	15:00–16:15	16:45–18:00	from 19:30
Research II	Kleptsyn	Ghys	Hubbard	Fuchs	<i>Mathematics of tides</i>
Research III		Tokieda	Matveev		
Friday 8	<i>Excursion to Wangerooge – Busses leave 6:00!</i>				
Saturday 9	9:30–10:45	11:15–12:30	15:00–16:15	16:45–18:00	
Research II	Werner	Fuchs	Werner	Ziegler	
Research III		Schleicher			
Sunday 10	9:30–10:45	11:15–12:30	15:00–16:15	16:45–18:00	
Research II	Werner	Andler	Werner	Zagier	
Monday 11	9:30–10:45	11:15–12:30	15:00–16:15	16:45–18:00	
Research II	Zagier	Bonk	Bonk	<i>Closing</i>	
Research III			Kleptsyn		
Tuesday 12	<i>Departure</i>				

Notes

- **Daily announcements** will be made at beginning of first plenary talk every morning.
- **Meals:** Breakfast 8:00–9:30, Lunch 12:00–13:30, Dinner 18:00–19:00 in College Nordmetall.
- **Lecture Halls:** All plenary talks will take place in the Research II Lecture Hall. Parallel talks will take place in the Research II Lecture Hall and the Research III Lecture Hall as indicated.
- **Discussion:** We encourage discussion and questions to any of the lecturers. Each lecture is additionally supported by a designated graduate teaching assistant who will be available afterwards during the days and typically in the evening to answer background questions.
- **Emergencies:** In case of any problems, especially medical ones, please contact the organizers immediately: at the help desk (see below), or by phone (campus extension 3210, cell phone +49-421-2003210 for the conference organizers). If you do not reach any of the organizers, contact the porters at campus extension 4800, cell phone +49-421-2004800.
- **Help Desk 9:10–18:00:** For any type of day-time assistance, tea, coffee, printing, sign-out in case of leaving campus, etc., there is a help desk in the Research II Tea Room.
- **Help Desk 19:00–24:00:** located in the College Common Room. There is no printing available at this time.

Trip to downtown Bremen

- Departure at 16:40 latest from the Jacobs Porters' lodge, then walk to Bremen–Schönebeck Station and trip to Bremen–Hauptbahnhof by train.
- Train tickets will be provided to you.
- You can explore the city center in small groups.
- The trip back to Bremen is by boat. Meeting point at 19:30 from Martinianleger (Schlachte) Bremen, boxed dinners will be provided there.

Trip to Wangerooge

- Busses leave at 6:00 in front of College Nordmetall.
- Breakfast will be provided on the busses.

Sunday, July 3

- 10:00–12:00** *Opening*
Campus Center West Wing
- 14:00–15:15** *Plenary lecture* (Research II Lecture Hall)
John H. Conway (Princeton University, USA)
The game of life and a life of games
Graduate teaching assistant on duty: Nikita Selinger
- 15:45–17:00** *Plenary lecture* (Research II Lecture Hall)
John H. Hubbard (Cornell University, USA; Université Aix-Marseilles, France)
Dynamics and chaos
Graduate teaching assistant on duty: Nikita Selinger
- 17:30–18:45** *Plenary lecture* (Research II Lecture Hall)
Sergei Tabachnikov (Pennsylvania State University, USA)
Flavors of “Bicycle Mathematics”
Graduate teaching assistant on duty: Nikita Selinger

Monday, July 4

- 9:30–10:45** *Plenary lecture* (Research II Lecture Hall)
Étienne Ghys (École Normale Supérieure de Lyon, France)
Surfaces and geometry
Graduate teaching assistant on duty: Nikita Selinger
- 11:15–12:30** *Plenary lecture* (Research II Lecture Hall)
John H. Conway (Princeton University, USA)
The game of life and a life of games
Graduate teaching assistant on duty: Nikita Selinger
- 15:00–16:15** *Plenary lecture* (Research II Lecture Hall)
John H. Hubbard (Cornell University; Université Aix-Marseilles)
Dynamics and chaos
Graduate teaching assistant on duty: Nikita Selinger
- 16:45–18:00** *Plenary lecture* (Research II Lecture Hall)
Tadashi Tokieda (University of Cambridge, UK)
Geometry and physics
Graduate teaching assistant on duty: Nikita Selinger
- 19:30–21:30** *Interdisciplinary Debate: The free will* (Research II Lecture Hall)
Gerhard Roth (Universität Bremen)
Free will and determinism from a philosophical and neurobiological point of view
Peter Schupp (Jacobs University)
Determinism and quantum mechanics
John H. Conway (Princeton University)
The Free Will theorem
Plenary Discussion, moderator: Étienne Ghys

Tuesday, July 5

- 9:30–10:45** **Plenary lecture** (Research II Lecture Hall)
Rostislav Matveev (Universität Leipzig, Germany)
Surfaces with polyhedral metrics
Graduate teaching assistant on duty: Goran Drazic
- 11:15–12:30** **Plenary lecture** (Research II Lecture Hall)
Dierk Schleicher (Jacobs University)
*On useless and useful mathematics:
Newton's method, chaos, and the Mandelbrot set*
Graduate teaching assistant on duty: Nikita Selinger
- 15:00–16:15** **Session talk** (Research III Lecture Hall)
Sergei Tabachnikov (Pennsylvania State University, USA)
Around four vortices
Graduate teaching assistant on duty: Maxim Rauwald
- 15:00–16:15** **Session talk** (Research II Lecture Hall)
John H. Conway (Princeton University, USA)
The game of life and a life of games
Graduate teaching assistant on duty: Nikita Selinger
- 16:30** **Depart for trip to downtown Bremen** (Porters' lodge)
Note: We take the train from Bremen–Schönebeck to Bremen Hauptbahnhof
Train tickets will be provided.
You can explore the city center in small groups.
- 19:30** **Return to Jacobs University by boat**
Meet at Martinianleger (Schlachte) in the center of Bremen
Boxed dinners will be provided, departure 20:00.

Wednesday, July 6

- 9:30–10:45** *Plenary lecture* (Research II Lecture Hall)
Martin Andler (Université Versailles-Saint-Quentin, France)
The Heisenberg group
Graduate teaching assistant on duty: Yauhen Mikulich
- 11:15–12:30** *Session talk* (Research III Lecture Hall)
Sergei Tabachnikov (Pennsylvania State University, USA)
Odds and ends
Graduate teaching assistant on duty: Maxim Rauwald
- 11:15–12:30** *Session talk* (Research II Lecture Hall)
John H. Conway (Princeton University, USA)
The game of life and a life of games
Graduate teaching assistant on duty: Yauhen Mikulich
- 15:00–16:15** *Session talk* (Research III Lecture Hall)
Rostislav Matveev (Universität Leipzig, Germany)
Surfaces with polyhedral metrics
Graduate teaching assistant on duty: Goran Drazic
- 15:00–16:15** *Session talk* (Research II Lecture Hall)
John H. Hubbard (Cornell University; Université Aix-Marseilles)
Dynamics and chaos
Graduate teaching assistant on duty: Yauhen Mikulich
- 16:45–18:00** *Session talk* (Research III Lecture Hall)
Tadashi Tokieda (University of Cambridge, UK)
Geometry and physics
Graduate teaching assistant on duty: Maxim Rauwald
- 16:45–18:00** *Session talk* (Research II Lecture Hall)
Étienne Ghys (École Normale Supérieure de Lyon, France)
Conformal maps
Graduate teaching assistant on duty: Yauhen Mikulich
- from 19:00** (College Nordmetall Study Area)
Graduate teaching assistant on duty: Yauhen Mikulich

Thursday, July 7

- 9:30–10:45** **Plenary lecture** (Research II Lecture Hall)
Victor Kleptsyn (Université de Rennes, France)
Lattices, codes and sphere packings in high-dimensional spaces
Graduate teaching assistant on duty: Goran Drazic
- 11:15–12:30** **Session talk** (Research III Lecture Hall)
Tadashi Tokieda (University of Cambridge, UK)
Geometry and physics
Graduate teaching assistant on duty: Maxim Rauwald
- 11:15–12:30** **Session talk** (Research II Lecture Hall)
Étienne Ghys (École Normale Supérieure de Lyon, France)
How to dress a ball, according to Chebychev
Graduate teaching assistant on duty: Goran Drazic
- 15:00–16:15** **Session talk** (Research III Lecture Hall)
Rostislav Matveev (Universität Leipzig, Germany)
Surfaces with polyhedral metrics
Graduate teaching assistant on duty: Goran Drazic
- 15:00–16:15** **Session talk** (Research II Lecture Hall)
John H. Hubbard (Cornell University; Université Aix-Marseilles)
Dynamics and chaos
Graduate teaching assistant on duty: Yauhen Mikulich
- 16:45–18:00** **Plenary lecture** (Research II Lecture Hall)
Dmitry Fuchs (University of California, Davis, USA)
Geodesics on regular polyhedra
Graduate teaching assistant on duty: Maxim Rauwald
- 19:30–20:30** **Mathematics of Tides** (Research II Lecture Hall)
- from 21:30** (College Nordmetall Study Area)
Graduate teaching assistant on duty: Goran Drazic

We'd like to draw attention to the Ph.D. thesis defense of Jacobs graduate student

Nikita Selinger

“On Thurston’s characterization theorem for branched covers”

at 17:00 in the Research III Lecture Hall. The thesis committee is composed of Dierk Schleicher (advisor), Daniel Meyer, and John Hubbard.

Abstract: Let f be a postcritically finite branched self-cover of a 2-dimensional topological sphere. Such a map induces an analytic self-map σ_f of a finite-dimensional Teichmüller space. We prove that this map extends continuously to the augmented Teichmüller space and give an explicit construction for this extension. This allows us to characterize the dynamics of Thurston’s pullback map near invariant strata of the boundary of the augmented Teichmüller space. The resulting classification of invariant boundary strata is used to prove a conjecture by Pilgrim and to infer further properties of Thurston’s pullback map. We obtain a complete topological description of canonical obstructions. Our approach also yields new proofs of Thurston’s theorem and Pilgrim’s Canonical Obstruction theorem.

Saturday, July 9

- 9:30–10:45** *Plenary lecture* (Research II Lecture Hall)
Wendelin Werner (Université Paris-Sud, Orsay, France)
Harmonic functions, random walks, and Brownian motion
Graduate teaching assistant on duty: Dzmitry Dudko
- 11:15–12:30** *Session talk* (Research III Lecture Hall)
Dierk Schleicher (Jacobs University)
Hausdorff dimension, its intuition, and some reasons and surprises
Graduate teaching assistant on duty: Dzmitry Dudko
- 11:15–12:30** *Session talk* (Research II Lecture Hall)
Dmitry Fuchs (University of California, Davis, USA)
Geodesics on regular polyhedra
Graduate teaching assistant on duty: Maxim Rauwald
- 15:00–16:15** *Plenary lecture* (Research II Lecture Hall)
Wendelin Werner (Université Paris-Sud, Orsay, France)
Harmonic functions, random walks, and Brownian motion
Graduate teaching assistant on duty: Dzmitry Dudko
- 16:45–18:00** *Plenary lecture* (Research II Lecture Hall)
Günter M. Ziegler (Freie Universität Berlin, Germany)
The many facets of the 24-cell
Graduate teaching assistant on duty: Maxim Rauwald
- from 19:00** (College Nordmetall Study Area)
Graduate teaching assistant on duty: Dzmitry Dudko

Sunday, July 10

- 9:30–10:45** *Plenary lecture* (Research II Lecture Hall)
Wendelin Werner (Université Paris-Sud, Orsay, France)
Harmonic functions, random walks, and Brownian motion
Graduate teaching assistant on duty: Dzmitry Dudko
- 11:15–12:30** *Session talk* (Research III Lecture Hall)
Martin Andler (Université Versailles-Saint-Quentin, France)
The Heisenberg group
Graduate teaching assistant on duty: Dzmitry Dudko
- 11:15–12:30** *Session talk* (Research II Lecture Hall)
Günter M. Ziegler (Freie Universität Berlin, Germany)
The many facets of the 24-cell
Graduate teaching assistant on duty: Maxim Rauwald
- 15:00–16:15** *Plenary lecture* (Research II Lecture Hall)
Wendelin Werner (Université Paris-Sud, Orsay, France)
Harmonic functions, random walks, and Brownian motion
Graduate teaching assistant on duty: Dzmitry Dudko
- 16:45–18:00** *Plenary lecture* (Research II Lecture Hall)
Don Zagier (Max Planck Institute Bonn, Germany; Collège de France)
Number theory
Graduate teaching assistant on duty: Dzmitry Dudko
- from 19:00** (College Nordmetall Study Area)
Graduate teaching assistant on duty: Maxim Rauwald
- 19:30–20:30** *Film from the 2009 International Mathematical Olympiad*
(Research II Lecture Hall)

Monday, July 11

- 9:30–10:45** **Plenary lecture** (Research II Lecture Hall)
Don Zagier (Max Planck Institute Bonn, Germany; Collège de France)
Number theory
Graduate teaching assistant on duty: Goran Drazic
- 11:15–12:30** **Plenary lecture** (Research II Lecture Hall)
Mario Bonk (University of California, Los Angeles, USA)
Analysis without smoothness
Graduate teaching assistant on duty: Yauhen Mikulich
- 15:00–16:15** **Session talk** (Research III Lecture Hall)
Victor Kleptsyn (Université de Rennes, France)
Lattices, codes and sphere packings in high-dimensional spaces
Graduate teaching assistant on duty: Goran Drazic
- 15:00–16:15** **Session talk** (Research II Lecture Hall)
Mario Bonk (University of California, Los Angeles, USA)
Analysis without smoothness
Graduate teaching assistant on duty: Yauhen Mikulich
- 16:45** **Closing Session** (Research II)
- 17:30** **Studying at Jacobs** (Research II)
Daniel Meyer, Marcel Oliver
- from 19:00** **Barbeque**
(In front of College Nordmetall)
Graduate teaching assistant on duty: Yauhen Mikulich