

# Conformal Field Theories and Renormalization Group Flows in Dimensions $d > 2$

## Schedule of Focus weeks (May 30- June 10)

Monday	May 30	<b>Conformal bootstrap I</b>
Tuesday	May 31	<b>Conformal bootstrap II</b>
Wednesday	June 1	<b>Miscellanea</b>
Thursday	June 2	<b>Weakly-coupled Conformal Field Theories</b> (Free afternoon)
Friday	June 3	<b>Superconformal theories</b>
Monday	June 6	<b>Hamiltonian truncation method</b>
Tuesday	June 7	<b>AdS3/CFT2 correspondence</b>
Wednesday	June 8	<b>Condensed matter applications</b> (Free afternoon)
Thursday	June 9	<b>S-matrix bootstrap</b>
Friday	June 10	<b>N=4 Super Yang-Mills theories</b>

### Monday May 30

#### Conformal bootstrap I

Moderator: David Poland

09:00 Registration

10:00 Joao Penedones (EPFL) "CFT basics"

11:00 coffee break

11:30 David Poland (Yale) "Introduction to the numerical bootstrap"

13:00 Lunch

14:30 Marco Serone (SISSA) "The Multipoint Bootstrap"

15:15 Miguel Paulos (CERN) "Extremal bootstrapping: go with the flow"

16:00 coffee break

16:30 Volker Schomerus (DESY) "Integrability of conformal partial waves"

## **Tuesday May 31**

### **Conformal bootstrap II**

Moderator: Joao Penedones

10:00 Silviu S. Pufu (Princeton) "Bootstrapping QED\_3"

11:00 Coffee break

11:30 Tobias Hansen (U. Porto) "Conformal blocks for mixed symmetry tensors"

12:15 Emilio Trevisani (U. Porto) "Radial expansions of conformal blocks"

13:00 Lunch

14:30 Ferdinando Gliozzi (U. Torino) "3d boundary bootstrap in algebraic form and critical surface exponents"

15:30 Coffee break

16:00 Denis Karateev (SISSA) "Seed Conformal Blocks in 4D CFT"

17:00 Mikhail Isachenkov (Weizmann) "Conformal blocks and Koorwinder polynomials", *informal discussion*

## **Wednesday June 1**

### **Weakly-coupled CFTs**

10:00 Simone Giombi (Princeton) "Anomalous dimensions of higher spin currents in the  $O(N)$  model in  $2 < d < 6$ "

11:00 Coffee break

11:30 Andy Stergiou (Yale U.) "Monotonicity Properties of RG Flows in 6d"

13:00 Lunch

### **Lorentzian CFTs**

14:30 Sandipan Kundu (Cornell) "Causality constraints in conformal field theory"

15:15 Diego Hofman (U. Amsterdam) "Proof of a/c bounds and the averaged null energy condition"

16:00 Coffee break

### **Miscellanea**

16:30 Serguei Gukov (Caltech) "RG phase transitions"

## **Thursday June 2**

### **Miscellanea**

10:00 Chris Hooley (St. Andrews) "Finite-density fermions interacting with gapless bosons: a condensed-matter perspective"

11:00 Coffee break

11:30 Benjamin Doyon (King's College London) "Non-equilibrium conformal field theory"

12:30 Joshua Qualls (Taiwan U.) "More on integrability and conformal partial waves"

13:00 lunch

*Free afternoon*

## **Friday June 3**

### **Superconformal Field Theories**

10:00 Leonardo Rastelli (YITP, Stony Brook), "Introduction & Case study of  $N=2$  in  $d=4$ "

11:00 Coffe break

11:30 Madalena Lemos (DESY), "Analytic bounds and the landscape of  $N=2$  superconformal theories"

12:10 Wolfgfer Peelaers (Rutgers), "Deformation quantization and superconformal symmetry in  $d=3$ "

13:00 lunch

14:30 Philip Argyres (Cincinnati), "Coulomb branches of  $N=2$  superconformal theories"

15:30 Coffee break

16:00 Vladimir Kazakov (ENS), "New integrable 3d and 4d theories from strongly twisted  $N=4$  super-Yang Mills"

## **Monday June 6**

### **Hamiltonian truncation session**

10:00 Slava Rychkov (CERN) "Introduction"

11:00 Coffe break

11:30 Ami Katz (Boston U.) "A Conformal Truncation Framework for Infinite-Volume Dynamics"

13:00 lunch

14:30 Robert Konik (Brookhaven) "Using the TCSA to Study Non-Equilibrium Physics in One and Two Dimensions Models"

15:30 Coffee break

16:00 Zohar Komargodski (Weizmann) "Conformal Field Theory with Quenched Disorder: Applications of Conformal Perturbation Theory and Large- $N$  Methods"

## **Tuesday June 7**

### **AdS3/CFT2 correspondence**

10:00 Jared Kaplan "Introduction"

11:00 Coffee break

11:30 Tom Hartman (Cornell) "Black Hole Collapse in the  $1/c$  Expansion"

12:10 Ethan Dyer (Stanford) "Bounds on Charged States in 2d CFT and 3d Gravity"

13:00 Lunch

14:30 Liam Fitzpatrick (Boston U.) "On Information Loss in AdS3/CFT2"

15:30 Coffee break

16:00 Eric Perlmutter (Princeton) "Bounding the Space of Holographic CFTs with Chaos"

## **Wednesday June 8**

### **Cond-mat applications**

Moderator: Slava Rychkov

10:00 Max Metlitski (Perimeter) "S-duality of Dirac fermions in 2+1D from electric-magnetic duality of topological insulators in 3+1D"

11:00 coffee break

11:30 Maissam Barkeshli (Station Q) "Quantum phase transitions between bosonic fractional quantum Hall states, superfluids, and Mott insulators"

12:30 Hirohiko Shimada (OIST Okinawa) "Fractal dimension of the polymers"

13:00 Lunch

### **Miscellanea**

14:30 Xi Yin (Harvard) "(Super-)Conformal bootstrap in 2D"

15:30 coffee break

16:00 Markus Luty (UC Davis) "Rates and anomalies in CFT"

## **Thursday June 9**

### **S-matrix bootstrap**

Moderators: Pedro Vieira and Joao Penedones

10:00 Joao Penedones (EPFL) "S-matrix Bootstrap from the Conformal Bootstrap"

11:00 coffee break

11:30 Pedro Vieira (ICTP-SAIFR & Perimeter) and/or Jonathan Toledo (Perimeter) "2D S-matrix bootstrap"

13:00 Lunch

14:30 Sasha Zhiboedov (Harvard) "S-matrix Bootstrap and the leading Regge trajectory"

15:30 Coffee break

16:00 Sergei Dubovsky (New York U.) "Towards a theory of the QCD string"

**Friday June 10**

**N=4 Super Yang-Mills**

10:00 Kristan Jensen (San Francisco) "Chaos and hydrodynamics near AdS<sub>2</sub>"

11:00 coffee break

11:30 Xinan Zhou (Stony Brook) "Holographic four-point functions made easy: general results for 1/2 BPS operators from Mellin amplitude"

12:15 Carlo Meneghelli (Stony Brook) "Bootstrapping N=4 SYM with defects"

13:00 lunch

*free afternoon*