Developments in Quantum Field Theory and Condensed Matter Physics

Events for:
Monday, November 5th - Wednesday, November 7th

Monday, November 5th

9:30am **Djordje Radicevic - SCGP Lecture Hall 102**

Title: Simple Thoughts on Anomalies

10:15am **Cenke Xu - SCGP Lecture Hall 102**

11:00am **Coffee Break - Simons Center Cafe**

11:30am **Ashvin Vishwanath - SCGP Lecture Hall 102**

Title: Role of monopole quantum numbers in unifying competing orders in quantum magnets

12:15pm **Lunch - Simons Center Cafe**

1:30pm **Luca Iliesiu - SCGP Lecture Hall 102**

2:15pm **Jaume Gomis - SCGP Lecture Hall 102**

Title: Dynamics of 3d Gauge Theories

3:00pm **Coffee Break - Simons Center Cafe**

3:30pm **Adam Nahum - SCGP Lecture Hall 102**

Title: Emergent symmetry and quasiuniversality at 3D critical points

4:15pm **Lukasz Fidkowski - SCGP Lecture Hall 102**

Title: Non-trivial quantum cellular automata in 3 dimensions

5:00pm   **Coffee Break - Simons Center Cafe**

5:15pm   **Michael Levin - SCGP Lecture Hall 102**

Title: Constraints on order and disorder parameters in (1+1)D

Tuesday, November 6th

9:30am   **Todadri Senthil - SCGP Lecture Hall 102**

Title: Deconfined quantum critical points in 3+1-D and a possible duality

10:15am   **Thomas Dumitrescu - SCGP Lecture Hall 102**

Title: Aspects of Adjoint QCD_4

11:00am   **Coffee Break - Simons Center Cafe**

11:30am   **Andreas Karch - SCGP Lecture Hall 102**

Title: "Generalized Particle/Vortex Duality and Domain Walls"

Abstract: New field theory dualities will be constructed using holography as a tool. An important role will be played by the topological field theory living on domain walls of confining gauge theories in 3+1 dimensions.

12:15pm   **Lunch - Simons Center Cafe**

1:30pm   **Xiao-Gang Wen - SCGP Lecture Hall 102**

Title: A classification of 3+1D topological orders

Abstract: We discuss a classification of 3+1D topological orders using their canonical boundary states. We will also discuss realizing those topological orders systematically using 2-gauge theories.

2:15pm   **Clay Cordova - SCGP Lecture Hall 102**

Title: 2-Group Global Symmetry

3:00pm   **Break - Simons Center Cafe**

3:10pm   **Vasilis Niarchos - SCGP Lecture Hall 102**

Title: Non-supersymmetric dualities and the phases of QCD3

Abstract: A scenario for the phases of vacuum QCD3 has been proposed recently by Komargodski and Seiberg. Three phases occur in this scenario: a phase of bosonization, a phase of spontaneous global symmetry breaking and a phase captured by a putative IR CFT. I will present a proposal that embeds this scenario in a non-supersymmetric Seiberg duality. The magnetic dual incorporates naturally all the proposed phases. In particular, it incorporates bosonization and symmetry breaking as different patterns of magnetic squark condensation (or in a string theory embedding as different patterns of open string tachyon condensation and brane reconnection). In addition, the proposal suggests a natural candidate for the IR CFT of the conjectured CFT phase.

3:55pm   **Coffee Break**

4:15pm   **SCGP/Physics Colloquium: Ashvin Vishwanath - Simons Center room 103**

Title: Topology and Entanglement in Quantum Matter: Past, Present and Future

Abstract: I will review recent developments in solid state physics that have compelled us to look more deeply at the role of topology and entanglement in quantum many particle systems. This has led to the prediction of entirely new strongly interacting phases and provided insights into existing states. Time permitting, I will discuss recent intriguing applications to graphene sheets twisted at a special `magic angle' where novel insulating and superconducting states have been experimentally observed.

Wednesday, November 7th

9:30am   **Subir Sachdev - SCGP Lecture Hall 102**

Title: Gauge theory for the cuprates near optimal doping

10:15am **Cherman Aleksey - SCGP Lecture Hall 102**

Title: Particle-vortex statistics and the nature of dense quark matter

11:00am **Coffee Break - Simons Center Cafe**

11:30am **Benini Francesco - SCGP Lecture Hall 102**

Title: Domain walls in 4D SQCD

12:15pm **Lunch - Simons Center Cafe**

1:30pm **Michael Scherer - SCGP Lecture Hall 102**

Title: Dirac fermions and critical phenomena: critical exponents and emergent symmetries

2:15pm **Lorenzo Di Pietro - SCGP Lecture Hall 102**

Title: 3d abelian gauge theories at the boundary

3:00pm **Coffee Break - Simons Center Cafe**

3:30pm **Nikhil Karthik - SCGP Lecture Hall 102**

Title: Numerical approach to three-dimensional IR conformality and associated dualities

4:15pm **David Poland - SCGP Lecture Hall 102**

Title: Bootstrapping the Minimal 3D SCF

5:00pm **Coffee Break - Simons Center Cafe**

5:15pm **Juven Wang - SCGP Lecture Hall 102**

Title: New Anomalies, 3+1D Quantum Matter, and 4d Gauge Theories