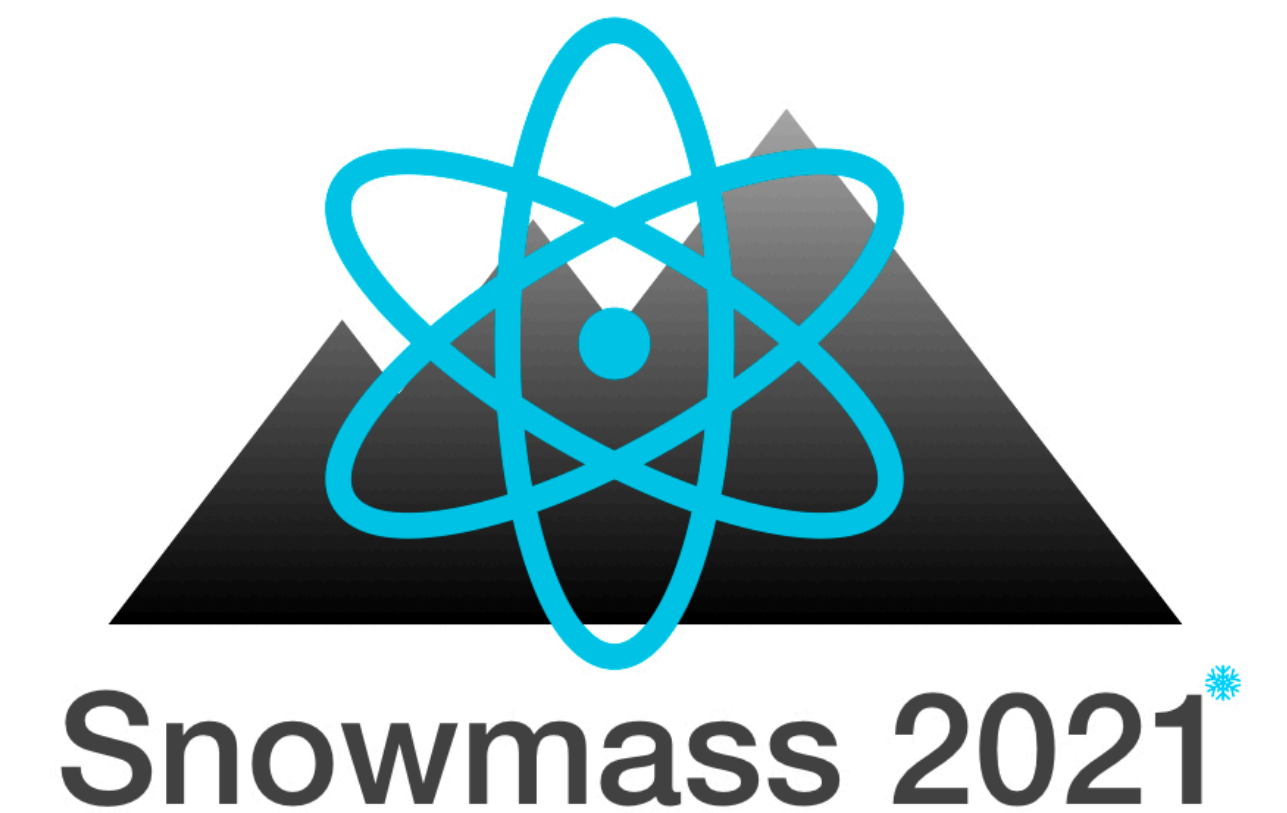
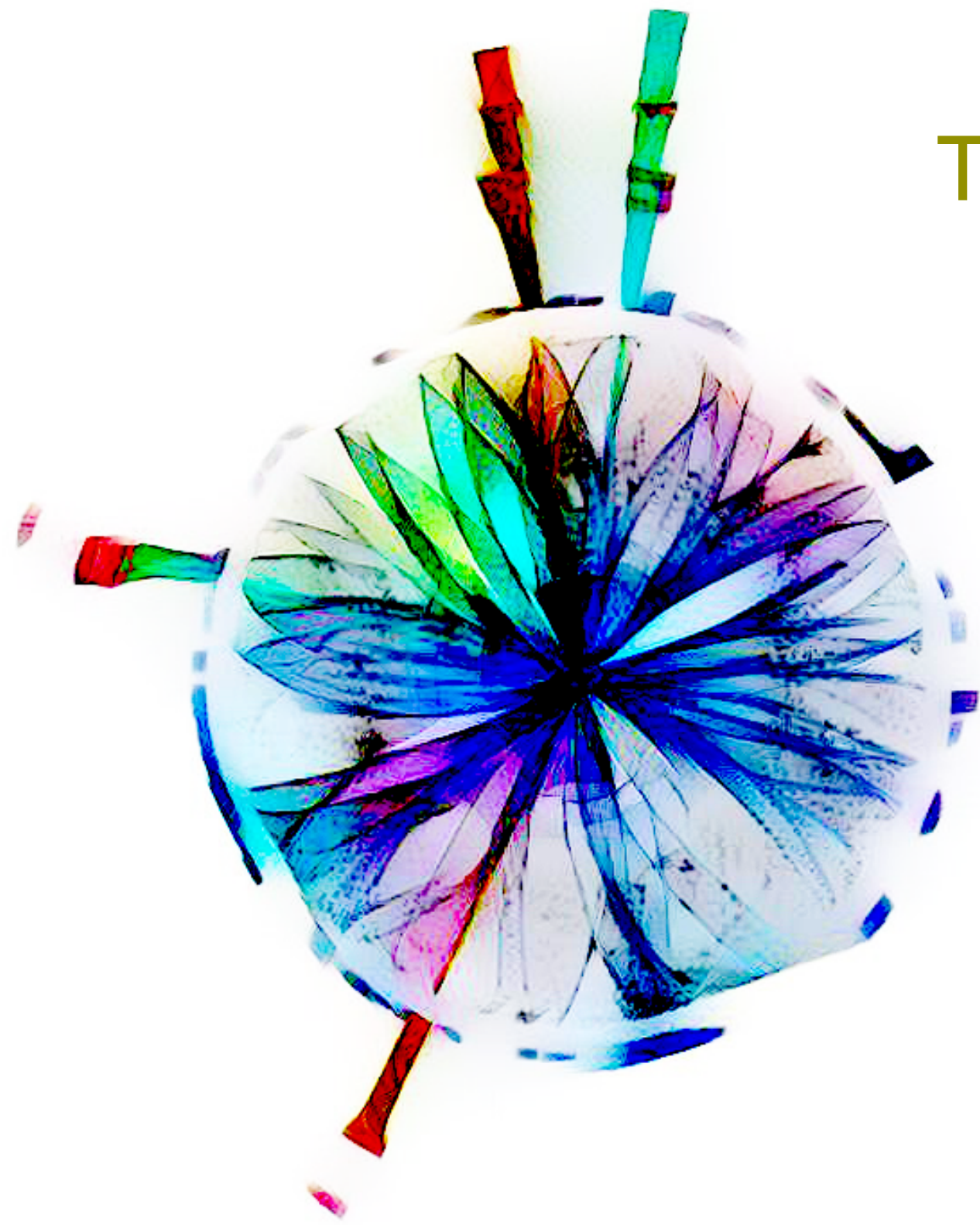


Theory Frontier

Nathaniel Craig, Csaba Csaki, and Aida El-Khadra
and
Theory Frontier Topical Group Conveners

Snowmass Day
24 Sep 2021



Theory Frontier Structure

<https://snowmass21.org/theory/start>



Nathaniel Craig
UCSB



Csaba Csaki
Cornell



Aida El-Khadra
UIUC

Topical Group		Topical Group Conveners			
TF01	String theory, quantum gravity, black holes	Daniel Harlow	Shamit Kachru	Juan Maldacena	
TF02	Effective field theory techniques	Patrick Draper	Ira Rothstein		
TF03	CFT and formal QFT	David Poland	Leonardo Rastelli		
TF04	Scattering amplitudes	Zvi Bern	Jaroslav Trnka		
TF05	Lattice gauge theory	Zohreh Davoudi	Taku Izubuchi	Ethan Neil	
TF06	Theory techniques for precision physics	Radja Boughezal	Zoltan Ligeti		
TF07	Collider phenomenology	Fabio Maltoni	Shufang Su	Jesse Thaler	
TF08	BSM model building	Patrick Fox	Graham Kribs	Hitoshi Murayama	
TF09	Astro-particle physics and cosmology	Dan Green	Joshua Ruderman	Ben Safdi	Jessie Shelton
TF10	Quantum information science	Simon Catterall	Roni Harnik	Veronika Hubeny	
TF11	Theory of Neutrino Physics	André de Gouvêa	Irina Mocioiu	Saori Pastore	Louis Strigari

Liaisons	Accelerator	Community Engagement	Computational
	Lian-Tao Wang (U Chicago)	Devin Walker (Dartmouth)	Steven Gottlieb (Indiana U)
Cosmic Flip Tanedo (UC Riverside)	Energy Laura Reina (Florida State U)	Neutrino Physics Irina Mocioiu (Penn State U) & Kaladi S. Babu (Oklahoma State U)	Rare Processes and Precision Alexey Petrov (Wayne State)

41 topical group conveners and liaisons
 ~100 theorists in the other frontiers

Theory Frontier Goals

- 🎤 Articulate the vibrancy of theory within high energy physics, its important role in relation to projects and its importance in its own right.
- 🎤 Highlight exciting developments in recent years and promising directions for the coming decade.
- 🎤 As a cross-cutting frontier, the Theory Frontier also aims to facilitate and coordinate theory-related activities in and across other frontiers.
- 🎤 Encourage broad engagement of the theory community with the Snowmass process

Theory Frontier Activities

- TF and TF topical groups organized 6 [workshops](#) (some cross frontier) to date.
- [Muon Collider Forum](#) (joint with AF and EF)
- [Save the Dates: 23-25 February 2022](#)
Theory Frontier Conference @ KITP: <https://www.kitp.ucsb.edu/activities/snowmass-c22>
Highlight...
 - activities within the TF topical groups
 - Theory efforts in all frontiers, including cross-frontier studies
- Several TF topical group conveners are involved in organizing cross-frontier white paper efforts involving AF, CF, CompF, EF, NF, and RPF
- [75 Contributed Papers](#) (aka white papers) known to us so far
- More are welcome: [TF Contributed Paper Form](#)
- Please contact the respective TF TG conveners to coordinate.
- Please encourage your **early career** group members to participate in writing Contributed Papers and/or support them if they plan to draft their own papers.

Theory Frontier breakout session

📌 [zoom link](#) (982 1761 9173 passcode: 795677)

📌 Discussion starts with summaries from each topical group with their activities and plans

📌 time for Q&A

📌 3:30-3:45pm EDT: Q&A with CompF