

Welcome !

SPCS 2023

The 2023 Shanghai Symposium on Particle Physics and Cosmology: Phase Transitions, Gravitational Waves, and Colliders

22-24 Sept 2023
Tsung-Dao Lee Institute

<https://indico-tkli.sjtu.edu.cn/event/1741/>

Organizing Committee:

Michael Ramsey-Musolf 任穆 (Tsung-Dao Lee Institute, Shanghai Jiao Tong University)
Huaikuo Guo (University of Chinese Academy of Sciences, ICTP-AP)
Fa Peng Huang (Sun Yat-Sen University)
Shu Li (Tsung-Dao Lee Institute, Shanghai Jiao Tong University)
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More Info



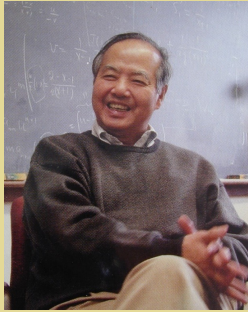
李政道研究所
TSUNG-DAO LEE INSTITUTE



Thanks !

- *All participants*
- *Organizing Committee*
- *TDLI Staff*
 - *Wang Wen*
 - *Yang Zi*
- *Students & post-docs*
 - *Wu Yanda*
 - *Xia Guotao*
 - *Zhong Yihong*
 - *Du Yong*
 - *Zhang Wenxing*
 - *Zhu Jiang*

T. D. Lee Institute / Shanghai Jiao Tong U.



Director

A point of convergence of the world's top scientists

A launch pad for the early-career scientists



A world famous source of original innovation

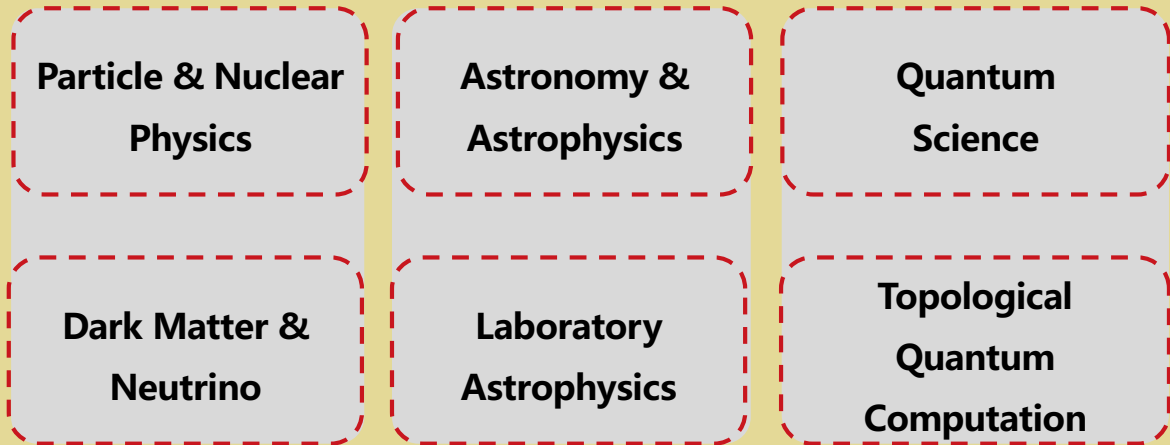
Founded 2016



Prof Jie Zhang

100+

Theory & Experiment



faculty members from 17 countries and regions, with over 40% of them foreign (non-Chinese) citizens

<https://tdli.sjtu.edu.cn/EN/>

Logistics

I. Presentations

- *Plenary talks: three full days !*
- *Parallel talks: Saturday evening (rooms to be announced Saturday morning)*

II. Symposium Dinner: tonight

- *Shanghai Bund*
- *Buses depart 18:00*

III. Meals at TDLI

IV. Symposium photo: Saturday afternoon

Science

- **Phase Transitions:**
 - *Meeting ground between particle physics, condensed matter physics cosmology, and astrophysics*
 - *Re-emerging as a forefront science driver for high energy physics and cosmology*
 - *Rich opportunities for theory-experiment interplay*
- **Illustration: electroweak phase transition**

BSM EWPT: Three Challenges

*Robust theory:
EFT + lattice
“Benchmark” P.T.*



*Observables:
model specific*



*Combined
reach: N_σ vs
S/N*



*Hydro:
 $\alpha, \beta / H_*$*



Questions

- *What are the different types of possible early universe phase transitions?*
- *What are their implications for particle physics ?*
- *How can we reliably compute their properties ?*
- *How can we probe them experimentally ?*
- *What are the opportunities for discoveries, new insights, and new research directions ?*