

## **Henry Sze-Hoi Tye**

Jockey Club Institute for Advanced Study and Department of Physics  
Hong Kong University of Science and Technology

### **Education :**

Ph.D. MIT 1974  
B.Sc. Caltech 1970  
Matriculation: La Salle College, HK 1966

### **Experience :**

2011-2016 Director, Jockey Club Institute for Advanced Study,  
Hong Kong University of Science and Technology  
2007-2013 Horace White Professor of Physics, Cornell University  
1987-2007 Professor of Physics, Cornell University  
1980-1987 Senior Research Associate, Cornell University  
1978-1980 Research Associate, Cornell University  
1977-1978 Research Associate, Fermi National Accelerator Laboratory  
1974-1977 Research Associate, SLAC, Stanford University

### **Present positions :**

2015- IAS Professor, Jockey Club Institute for Advanced Study, HKUST  
2013- Horace White Professor of Physics, Emeritus, Cornell University  
2011- Chair Professor of Physics, Hong Kong University of Science and  
Technology

### **Research Interests :**

Primary research interest is in elementary particle theory, including topics such as high energy phenomena, interface between particle physics and cosmology and superstring theory. Recent research interest is mainly on the origin of the universe and how the superstring theory describes nature, in particular how high energy experiments and cosmological/astronomical observations can test superstring theory. These include the following topics :

- \* the study of how the inflationary universe may be realized within string theory (e.g. brane inflation),
- \* why strings in string theory should appear as cosmic strings and how to detect them (via micro-lensing or gravitational wave detection),
- \* the origin of dark energy and dark matter
- \* the naturalness of the exponentially small cosmological constant can be understood as a consequence of the stringy dynamics in the context of the cosmic stringy landscape.

**Representative publications** (*5 recent and 5 earlier publications*) :

S.-H. H. Tye and S. S. C. Wong,  
“Linking Light Scalar Modes with A Small Positive Cosmological Constant in String Theory,”

Journal of High Energy Physics **1706**, 094 (2017)  
[arXiv:1611.05786 [hep-th]].

S.-H. H. Tye and S. S. C. Wong,  
“Bloch Wave Function for the Periodic Sphaleron Potential and Unsuppressed Baryon and Lepton Number Violating Processes,”

Phys. Rev. **D 92**, 4, 045005 (2015) [arXiv:1505.03690 [hep-th]].

D. F. Chernoff and S.-H. H. Tye,  
“Inflation, string theory and cosmic strings,”

Int. Journal Mod. Phys. **D 24**, 03, 1530010 (2015) [arXiv:1412.0579 [astro-ph.CO]].  
Article in “One Hundred Years of General Relativity: From Genesis and Empirical Foundations to Gravitational Waves, Cosmology and Quantum Gravity.”

Y. Sumitomo and S.-H. H. Tye,  
“A Stringy Mechanism for A Small Cosmological Constant - Multi-Moduli Cases,”  
Journal of Cosmology and Astroparticle Physics **1302**, 006 (2013) [arXiv:1209.5086 [hep-th]]

S.-H. H. Tye and D. Wohns,  
“Resonant Tunneling in Superfluid Helium-3,”  
Phys. Rev. **B 84**, 184518 (2011)  
[arXiv:1106.3075 [cond-mat.other]].

S. Sarangi and S.-H. H. Tye,  
“Cosmic String Production towards the End of Brane Inflation,”  
Physics Letters **B 536**, 185 (2002) [arXiv:hep-th/0204074].

G. R. Dvali and S.-H. H. Tye,  
“Brane Inflation,”  
Physics Letters **B 450**, 72 (1999) [arXiv:hep-ph/9812483].

H. Kawai, D. C. Lewellen and S.-H. H. Tye,  
“A Relation Between Tree Amplitudes of Closed and Open Strings,”  
Nucl. Phys. **B 269**, 1 (1986).

W. Buchmuller and S.-H. H. Tye,  
“Quarkonia and Quantum Chromodynamics,”  
Phys. Rev. **D24**, 132 (1981).

A. H. Guth and S.-H. H. Tye,  
“Phase Transitions and Magnetic Monopole Production in the Very Early Universe,”  
Phys. Rev. Lett. **44**, 631 (1980)