

# Prof. Jian-Xin Lu

**Name:** Jian-Xin Lu

**Email:** jxlu@ustc.edu.cn



## Positions held & Education

Sept. 2022 -- present	Chair Professor, USTC
May. 2002 -- present	Professor, USTC
Sept. 1999 -- Apr. 2002	Senior Research Fellow, University of Michigan
Sept. 1997 -- Aug. 1998	Research Associate, Texas A&M University
Sept. 1994 -- Aug. 1997	Research Assistant Professor/Research Associate, Texas A&M University
Sept. 1992 -- Aug. 1994	Postdoctor, CERN
Sept. 1988 -- Aug. 1992	Ph.D, Texas A&M University (Supervisor: Michael J. Duff)

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## Areas of research

Grand unified theory, Gravity and supergravity, String/M-theory & its application.

## Research achievements

Prof. Lu's research interest lies in string/M-theory and the related topics. He made a significant contribution to the non-perturbative string/M-theory during the so-called second string revolution. He was one of first few people to discover the non-perturbative brane objects as solitons in string theory and to classify them systematically, with one new class of the branes each having its worldvolume modes as a vector multiplet and being recognized later as the D-branes found by Polchinski et al via a completely different approach, i.e., applying the so-called T-duality, found from closed strings, to open strings. This finding not only provides the basis for various string dualities, including the well-known AdS/CFT correspondence, but also reveals the connection between string and branes which had before been thought otherwise, indicating that string theory is not merely strings and the branes so discovered have to be included into consideration, giving now so-called M-theory, a candidate for the unified theory of all interactions of nature.

His recent focus is on the open string pair production of D brane systems in Type II superstrings, finding an enhancement for this production and proving that the non-perturbative open string pair production rate agrees precisely with the corresponding non-perturbative rate computed in QED in the weak-field limit. Note that the open strings so produced come from those connecting different D branes, therefore along directions transverse to the branes. As such, the detection of the usual Schwinger pair production in QED may provide a new means for extra dimension(s) and dark matter among other things.

He has published more than 70 research papers with over 3900 total citations. Among these, the invited 'string soliton' review article published in Physics Reports with Duff and Khuri (mostly based on the authors' own work) is now cited more than 800 times, being a classic reference in string/M theory, and the other research paper cited more than 600 times with the additional six papers each cited more than 100 times.

## Recent research interests

M-brane dynamics and possible dualities, symmetries of M-theory, open string pair production and its enhancement, Matrix theory.

[Link for publications](#)