THURSDAY COLLOQUIUM

Department of Physics, Tsinghua University

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Title A New Search for Neutron Electric Dipole Moment (nEDM)

Speaker **Prof. Haiyan Gao**

(Duke University)

Venue ZhengYu-Tong Lecture Hall

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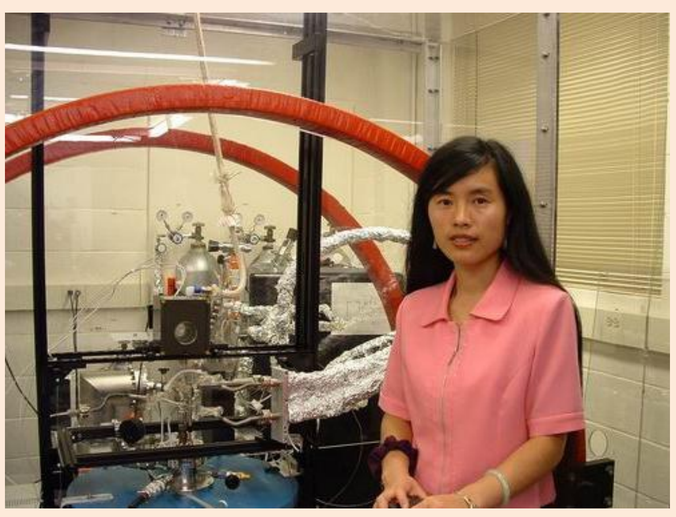
Abstract: A new experiment is being planned to search for the neutron Electric Dipole Moment (nEDM) with an unprecedented sensitivity. The proposed search aims at a two orders of magnitude improvement over the current experimental limit. A search for a non-zero value of the neutron EDM is a direct search of the time reversal symmetry (T) violation. It provides a unique insight into CP (Charge conjugation and Parity) violation because of the CPT theorem. The Standard Model (SM) prediction for the neutron EDM is below the current experimental limit by several orders of magnitude. However, many proposed models of electroweak interaction which are extensions beyond the SM predict much larger values of neutron EDM. The new experiment has the potential to reduce the acceptable range of predictions by two orders of magnitude. Furthermore, if new sources of CP violation are present in nature beyond the Standard Model and are relevant to hadronic systems, this experiment offers a unique opportunity to measure a non-zero value of nEDM. The current understanding of the baryogenesis suggests that other sources of CP violation might exist in nature beyond the Standard Model and beyond what have been observed so far. To explain the baryon number asymmetry in the universe through the grand unified theory or electroweak baryogenesis, substantial New Physics in the CP violation sector is required. In this talk, I will discuss this new experiment following a brief review of previous neutron EDM experiments.

Introduction to the Speaker



1966年出生上海，1984年毕业于上海行知中学，1988年获清华大学物理学学士学位，1994年获加州理工学院物理博士学位，1995年曾获麻省理工学院Peter Demos奖。1994年至1996年在美国伊利诺伊大学（UIUC）做博士后。1996年至1997年任美国阿贡国家实验室助理物理学家。1997至2002年任麻省理工学院物理系助理教授。2000年获美国能源部杰出青年教授奖。2002年被杜克大学聘为副教授(终身)，并在2002年至2004年期间在麻省理工学院兼任副教授。2005年获得中国国家自然科学基金委海外青年学者合作研究基金。2006年至2009年任杜克大学物理系副系主任,2007年当选为美国物理学会Fellow. 2008年7月起任杜克大学物理系终身正教授。目前是清华大学物理系长江讲座教授。从事中高能实验核物理学研究，在国际核心学术刊物上发表论文90多篇，其中36篇发表在Physical Review Letters。在很多国家和地区共被邀请做过报告180余次。高海燕教授目前是全球华人物理学会副主席，并最新当选为美国物理学会General Councilor.