



2025



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10:30-12:00

地点



标本楼308会议室



主讲人

**Mark
Thiemens**

美国科学院院士

DEEPER Forum
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New Measurements and Theory of Mass Independent Isotope Effects and Relation to Archean, Atmosphere and Solar System Origin Using Quantum Dynamics

报告摘要

The measurement of stable isotopes in natural phenomena dates back to 1947 when an equilibrium isotope exchange model of isotopes was developed by Urey and the stable isotope ratio mass spectrometer was developed by Nier. Since then, the applications have been extensive. A new class of isotope effects not reliant upon mass were discovered and explored by Thiemens and include photochemistry effects in the atmosphere, origin of the solar system, and, using sulfur isotopes many groups have developed understanding of the origin and evolution of life. A limit in our ability to model these systems at high resolution is that we do not know the isotope fractionation of photodissociation as a function of energy. The effects are in the UV range, and it is impossible to measure across the spectrum because one needs a synchrotron, and it requires a day for a single measurement. What is needed is a theory that allows one to calculate these effects. In this talk, new applications of quantum effects that have never been included before are discussed and the theory and measurements are shown.

人物简介

Mark Thiemens院士是加州大学圣地亚哥分校(UCSD)化学与生物化学系讲席讲授，曾任UCSD自然科学学部创办主任(2000-2016)。Thiemens院士主要从事同位素地球化学、大气化学、宇宙化学等方面的研究，他发现了化学过程产生的同位素非质量依赖分馏效应(MIF)，开拓了MIF在地球和行星科学的广泛应用，在多个研究领域发表了多篇具有影响力的论文，其中Science 22篇、Nature 8篇、PNAS 23篇。Thiemens院士是美国科学院院士和英国皇家学会外籍院士，Goldschmidt奖章(地球化学学会)、Leonard奖章(陨石学会)等国际学会最高荣誉获得者，AGU、GS、EAG等学会会士，目前是PNAS的地学编委。

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