

## **EINLADUNG**

zum Vortrag  
von

**Dr. Robert McGraw**

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### **Contributions of 19<sup>th</sup> - century physical chemistry to modern understanding of atmospheric nucleation processes**

am

**Dienstag, 27. Mai 2014, um 17:30 Uhr**

Ort: Lise-Meitner-Hörsaal, Fakultät für Physik, Universität Wien,  
1090 Wien, Strudlhofgasse 4 / Boltzmannngasse 5, 1. Stock

*Barrierefreier Zugang: Boltzmannngasse 5, Lift, 1. Stock rechts über den Gang zum Hintereingang des Hörsaals*

**Abstract:**

I take this opportunity to review for a general scientific audience how early pioneering ideas at the foundations of physical chemistry remain so remarkably fertile in the quest towards molecular-level understanding of the nucleation process, generally, and as a guide to interpretation of the latest experimental measurements. The talk will illustrate powerful theoretical approaches for inferring molecular-level information including critical nucleus size, energy, and composition directly from measurements of the relative sensitivities of the nucleation rate to changes in gas-phase precursor concentrations and temperature. Connections between these so-called “nucleation theorems” and the even more fundamental law of mass action and Arrhenius temperature dependence are described. Modern scaling approaches to nucleation based on the Gibbs-Thompson (Kelvin) equation are shown to explain the major discrepancies encountered when comparing the predictions of classical nucleation theory to modern nucleation rate measurements. Finally, the implications of these findings to understanding atmospheric new particle formation and its impact on climate are discussed.

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