



Open PhD Position in Theoretical Biophysics (65% TVöD, E13):
Cations in charge of RNA folding and function
Max Planck Institute of Biophysics, Frankfurt, Germany

The Max Planck Institute of Biophysics, Department of Theoretical Biophysics of director Gerhard Hummer, has one opening for PhD students. The opening is within the Emmy Noether Research group of Nadine Schwierz-Neumann. The work focuses on the theoretical description of the interaction between RNA and metal cations using computer simulations and methods from statistical physics.

Metal cations are indispensable for RNA folding and function, two interlinked and vitally important physiological processes. Gaining detailed insight allows us to make targeted use of cations to manipulate structure formation, biological function, and even gene expression. In addition, metal cation deficiencies are associated with severe neurodegenerative diseases and cancer. A fundamental understanding of metal ions and RNA is therefore essential to drive advances in modern medicine and to develop new RNA-based tools for therapeutics.

Resolving the role of metal cations is challenging experimentally since the resolution of state-of-the-art techniques is insufficient to characterize the exact interactions. Here, computational methods can contribute important insight. Our work combines state-of-the-art simulation methods and a consistent bottom-up modeling approach as a framework for a thorough understanding of metal cations and RNA. This allows us to provide a comprehensive view of cation-RNA interactions in systems ranging from basic structural motifs to large, biologically relevant and catalytically active RNA macromolecules.

Candidates with background in statistical and soft matter physics and expertise in methods such as all-atom and coarse-grained simulations, QM/MM simulations, high performance computing, advanced sampling techniques, and programming are highly encouraged to apply.

Applications including CV, cover letter, and the names of at least one referee, should be send electronically to

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The Max Planck Society is an equal opportunity employer, and particularly encourages female applicants. It also tries to increase the proportion of scientists with physical disabilities. Respective applications are welcome.