

SPP 1929 – Seminar

31. Juli 2018, 15:00 Uhr

Universität Rostock

HS II

Albert-Einstein-Straße 24, 18059 Rostock

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Ultralong-range Rydberg Molecules: Spin Interactions, External Fields and Symmetry Breaking

Rydberg excitation of cold and ultracold atomic quantum gases provides a way to introduce long-range interactions between atoms and can make the gas a highly non-linear medium. This leads to a number of interesting phenomena such as electromagnetically induced transparency, molecular formation, and polaron formation, which have recently been studied. This talk focuses on the formation of exotic molecular bound states between the Rydberg atom and one or more ground state atoms of the quantum gas. To fully explain experimental results, it is necessary to include relativistic spin couplings of the valence electrons to the orbital and nuclear angular momenta in the partial wave expansion of the electron scattering. One consequential effect is the breaking of the spherical symmetry of s state electronic orbitals when a magnetic field is present.