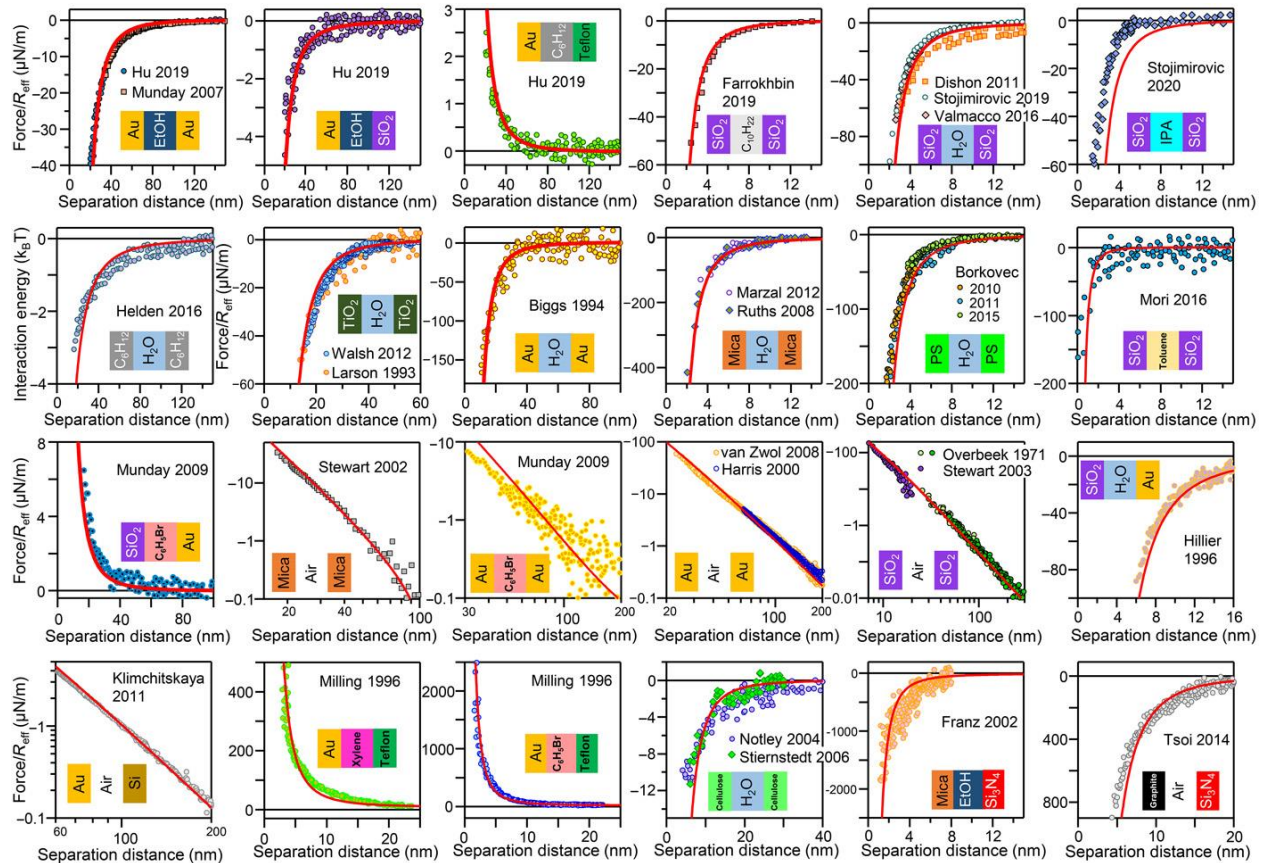


Accurate determination of dielectric function in the vacuum UV range enables the precise computation of Casimir-vdW forces

Our paper on self-consistent dielectric functions of materials is now published in [Science Advances](#).



Research on theoretical calculation of Casimir-van der Waals (vdW) forces is characterized by a great number of inconsistencies and conflicting reports with widely differing results for many known materials, including water, contradicting experimental measurements. Despite its importance for conceptual advances in both fundamental aspects and practical applications, a universal framework for the accurate determination of Casimir-vdW forces is lacking. Here we proposed a universal theoretical platform for computing Casimir-vdW forces, accounting for the electronic dielectric constant, optical band gap, density, and chemical composition. Using this methodology we determine the dielectric function for 55 materials, over a wide range of photon energies, covering an extensive list of common metals, organic and inorganic semiconductors, and insulators.