Towards a unified treatment of the plasma-solid system.
The Kiel research project 'The Plasma Interface'

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The interaction of low-temperature plasmas with a solid surface is of rapidly growing importance for many applications, and very similar issues arise in plasma-liquid interaction, plasma medicine and fusion plasmas. Despite impressive progress in recent years, modeling and diagnostics of plasmas are hampered by the poor knowledge of the effect of the surface on the plasma which is usually taken into account via phenomenological coefficients such as sticking or secondary emission probabilities that are, in turn affected by the plasma.

On the other hand, solids exposed to a plasma are poorly understood as well. The role of charged particles and nonequilibrium behavior pose challenges for both simulations and experiment.

A new research project in Kiel that involves plasma and condensed matter physicists, chemists and material scientists aims at devloping a selfconsistent treatment of the plasma-solid interface. This includes in situ diagnostics of solid surfaces exposed to the plasma in integrated modeling of processes at the interface.