

Plenary Talk (SAMOP) PV VII Tue 9:15 HSZ 02
Interactions of ions, atoms, and photons with surfaces and capillaries — ●JOACHIM BURGDÖRFER — Institute for Theoretical Physics, Vienna University of Technology

Atomic collisions with extended systems such as solid surfaces represent a considerable challenge to theory in view of the multi-scale nature of the problem and the large number of degrees involved. In turn, they provide an ideal testing ground for the description of many-

body systems at the quantum to classical crossover. The latter results from both the small de Broglie wavelength and the presence of strong decoherence in open large quantum systems. We will discuss recent developments with the help of a few illustrative examples. They include the probing of ab-initio surface potentials for metals and insulations by grazing-incidence scattering, quantum diffraction in fast atom-surface scattering, time-resolved photoemission from surfaces, nanostructuring of surfaces by highly charged ions, and ion guiding by nano-capillaries.