



Kolloquium des Fachbereichs Mathematik

Es spricht am **Montag, 09. Mai 2022 um 16:00 Uhr**

Herr Dr. Gaël Rigaud (Universität Stuttgart)

zum Thema: **“Compton scattering imaging: overview and challenges”**

Abstract:

The current development of high-sensitive energy detectors, i.e. able to collect incoming photons in terms of energy, opens the way to new applications in imaging. Among them, Compton scattering imaging (CSI) is a nascent concept based on the Compton effect, i.e. the scattering of a photon by an electron, and exploiting the scattered radiation as a specimen of interest is illuminated by a gamma source. The associated inverse problem rises two challenges:

(i) modelling the scattered spectral data since the measured photons can be scattered multiple times before to be detected, the photon beam suffers a significant attenuation along the traveling path and the stochastic nature of ionizing sources leads to a significant noise;

(ii) reconstructing the 2D/3D electron density map or at least features of the targeted object. This presentation will provide a short introduction to the physics of scattering, then present a general model for the spectral data. Motivated by the (microlocal) analysis of the forward operators, analytic and data-driven reconstruction strategies are presented and illustrated on synthetic data.

The future challenges of CSI will be discussed at the end of the talk.

Der Vortrag findet in Präsenz im Fakultätssaal 8.122 statt und wird online per Webex übertragen.

<https://unistuttgart.webex.com/unistuttgart-en/j.php?MTID=mec6c591a6b6b3080bdbccf9c0be641fb>

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