

STFC Centre for Fundamental Physics: Meeting on scattering theory

Dear Colleagues,

The STFC Centre for Fundamental Physics (CfFP) is planning to host a small discussion meeting on scattering theory at the Rutherford Appleton Laboratory, bringing together interested parties from a wide range of fields. The meeting will be held at RAL at the end of February or beginning of March (the exact date is still to be determined). The aim is to formulate a common strategy for tackling problems not usually considered by the various communities who work with scattering theory, such as laser physicists or ionospheric researchers. These novel problems include the study of scattering from ion acoustic waves which were present before the release of the Cosmic Microwave Background.

Electromagnetic scattering is critical to many areas in physics; however most of these areas deal with the same mechanisms, in which radiation is scattered from an ionised medium. Applications include active scattering, where a probing EM wave from a laser or radar is used to investigate plasmas in tokamaks, laboratory plasmas, ionospheres and magnetospheres; or passive scattering, in which the EM wave is generated by the medium itself. Examples of passive scattering processes include the transport of radiation inside the sun (generated by bremsstrahlung), the scattering of radiation in the big bang plasma before combination and the release of the cosmic microwave background, or the scattering of stellar and quasar radiation from plasma in the foreground.

A key difference between active and passive scattering is that, in passive scattering, the EM radiation is usually broadband and incoherent. Both active and passive scattering provide examples of linear and nonlinear scattering processes. Processes to be discussed include the parametric instabilities, which are examples of nonlinear scattering processes, and Raman amplification, which is an application of the usual synchrotron radiation process. During the meeting, we plan to extend the discussion of scattering theory further, to include the possibilities for detecting EM scattering from gravitational waves and space time fluctuations.

Although we cannot guarantee to pay travel expenses, local accommodation and transport to the Rutherford Appleton Laboratory will be provided as part of the meeting. If you would be interested in attending such a meeting, please inform Prof. Bob Bingham (bob.bingham@stfc.ac.uk) with a copy to Nikki Legge (nikki.legge@stfc.ac.uk) who will make the organisational arrangements, indicating on which dates you would be available in late February or early March. The final date will be selected to suit the availability of the largest number of interested participants.

With best regards

Ian McCrea
(on behalf of Prof. Bob Bingham)