

Fluid Dynamics Seminar

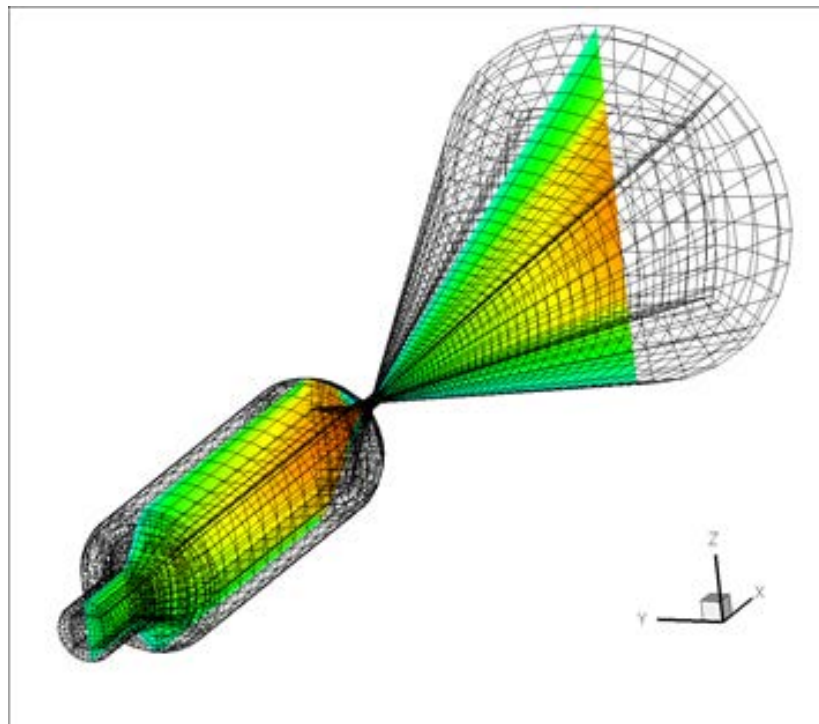
Date: Wednesday, May 31st 2017 at 13:00

Location: ZARM, Room 1730

Rarefied gas dynamics in thermo-electric propulsion systems

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In the present lecture basic principles of acceleration with transonic micronozzles in space are explained. Furthermore the special behavior of downscaling compressible flow simulations is discussed. In this regime high deviations between pressure drop measurement data and solutions of the compressible Navier-Stokes equation are detected. So different methods like correction methods, slip models and discrete kinematic approaches are presented for the prediction of compressible microflows. The temperature of the gas flow is a central model parameter for steering the efficiency of a micropropulsion system. This parameter is investigated for different applications like heating by an electric arc inside an arcjet under space conditions. Finally heat coupling and the thermal load of a thermo-electric propulsion system are discussed. The precise prediction of electric micropropulsion efficiency has still a central meaning for the success of future deep-space missions.