

A glimpse into technological applications of plasmas

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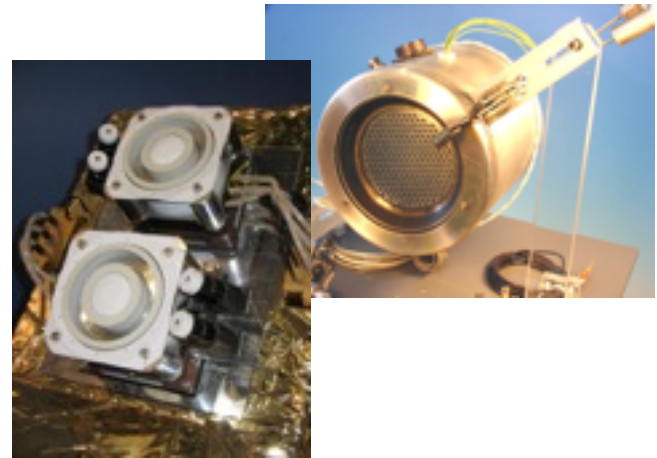
Página personal: <http://plasmalab.aero.upm.es/~lcl/>

Overview of technological applications of plasmas.

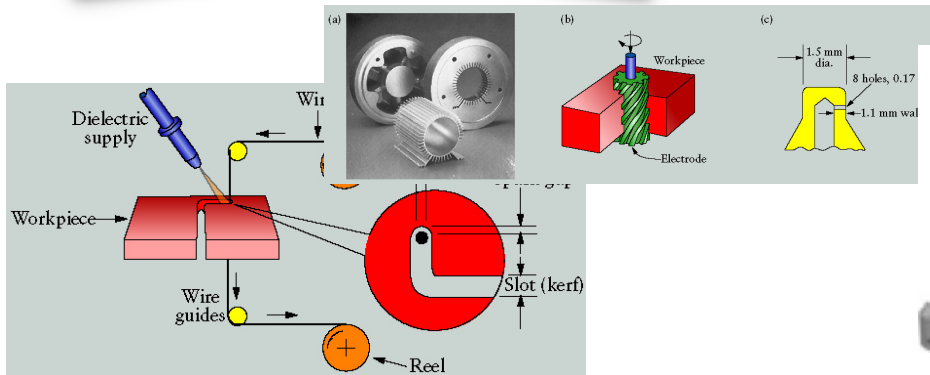
Electric discharges in low pressure gases



Plasmas for space propulsion



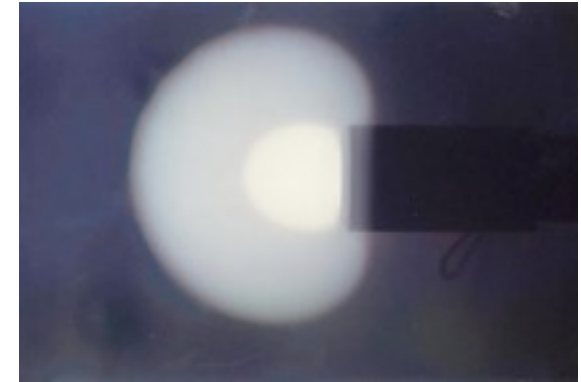
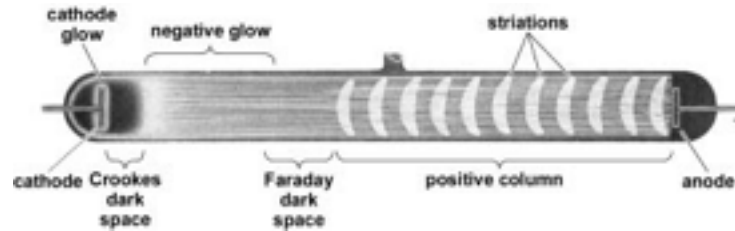
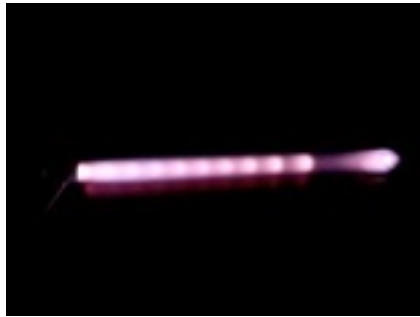
Precision machining



Materials modification



Laboratory plasmas produced by electric discharges



The gas discharge physics is a subject of current research with a huge number of practical applications. These devices are employed in a variety of technological fields such as lighting, material modifications, micromachining, ...

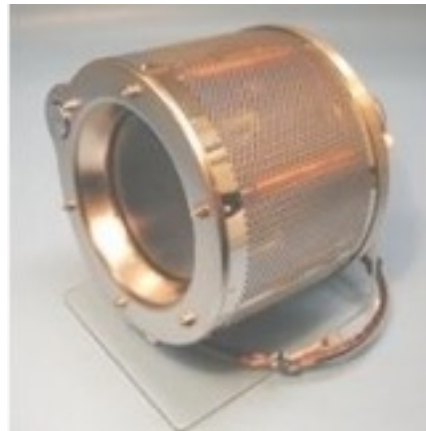
Plasma propulsion in space



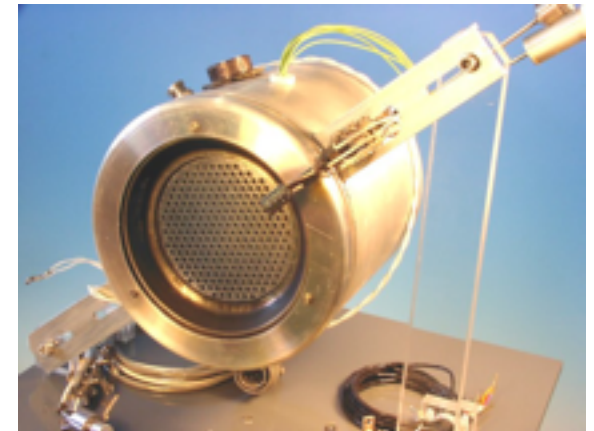
Safran-Snecma
PPS 1350
(France)



NSTAR (Hughes,
NASA) USA



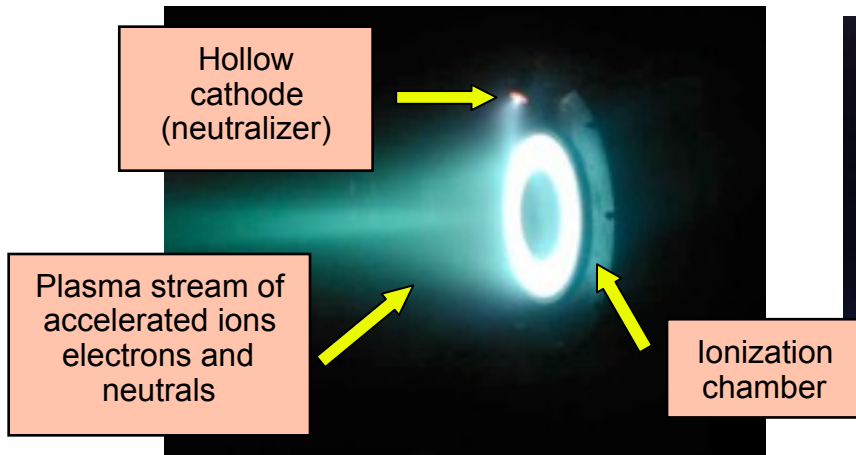
T5 Quinetiq UK



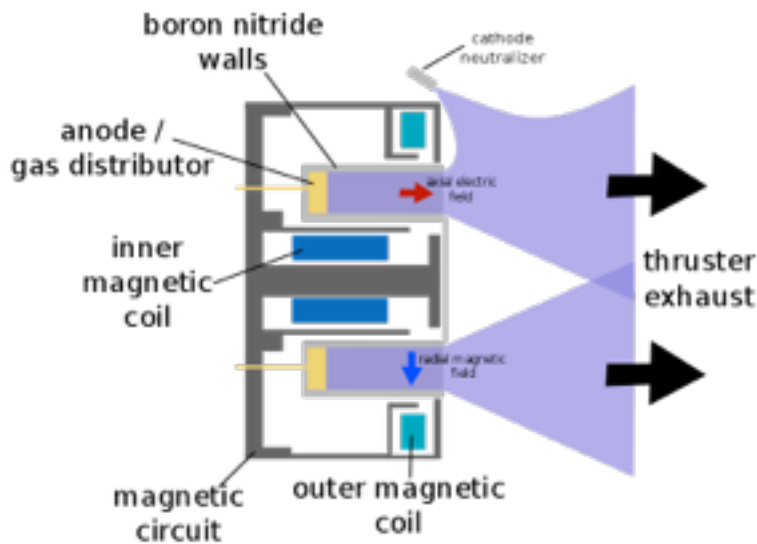
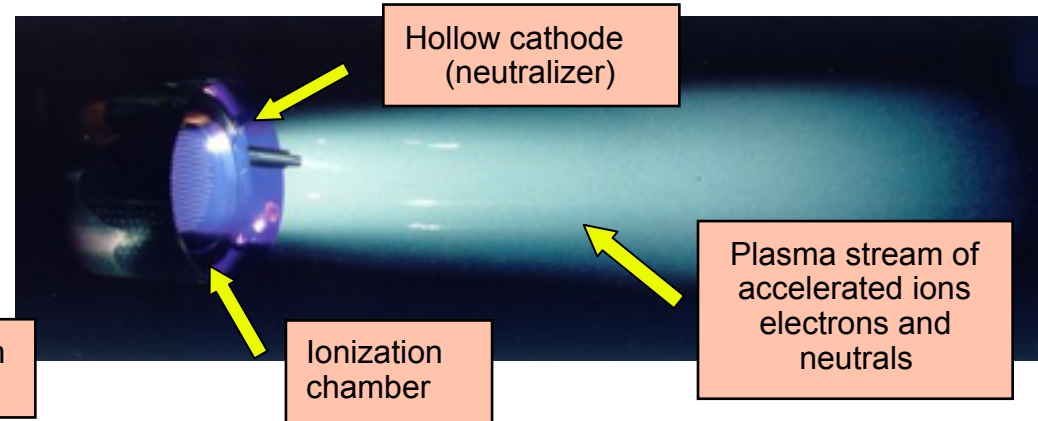
Giessen University μ RIT Astrium
(Germany)

Plasma thrusters, different concepts and configurations.

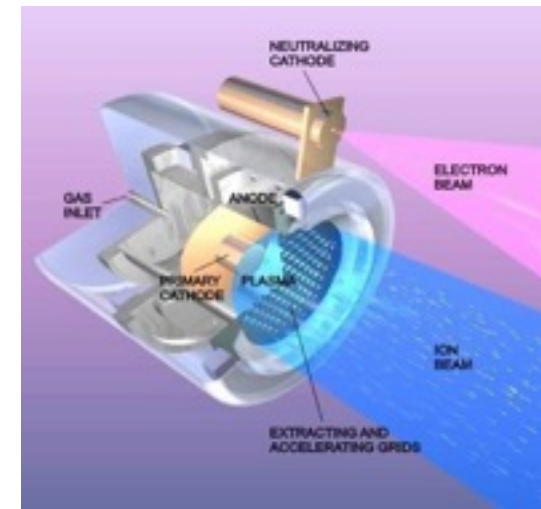
Hall effect thruster



Gridded electrostatic thruster



Ion acceleration by E and $E \times B$ fields

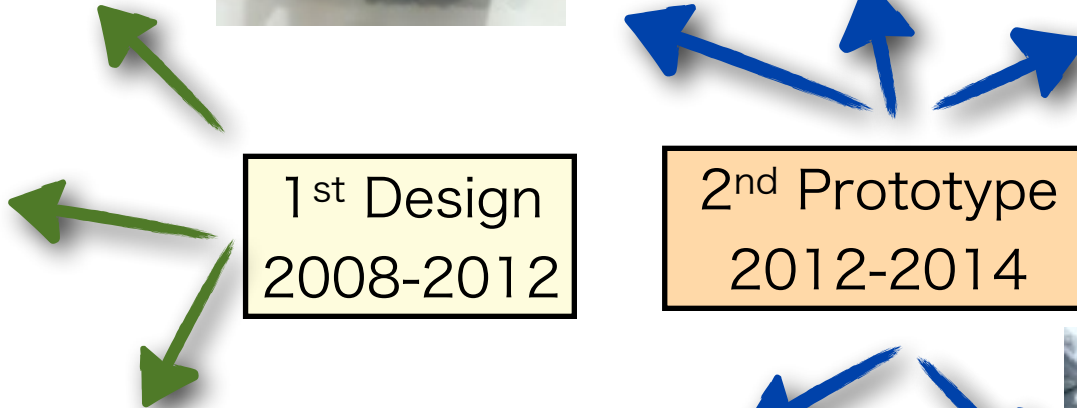
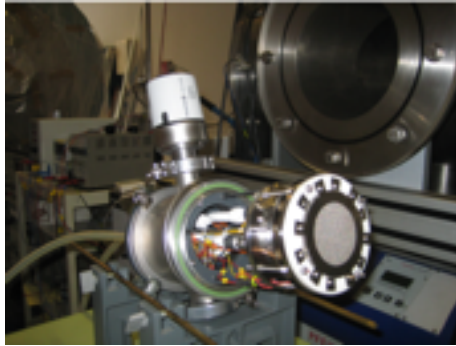


Ion acceleration by a set of metallic grids, essentially static.

An active line of research

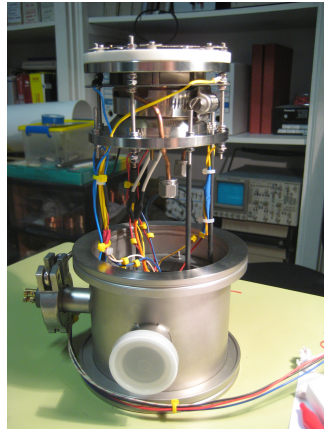
New improved magnetic configuration

lightweight and modular



1st Design
2008-2012

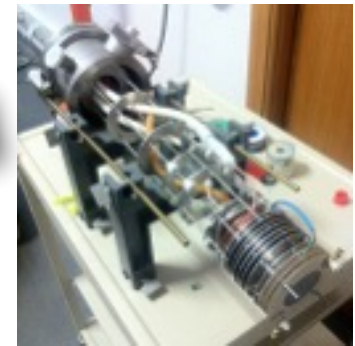
2nd Prototype
2012-2014



Previous Magnet Ring

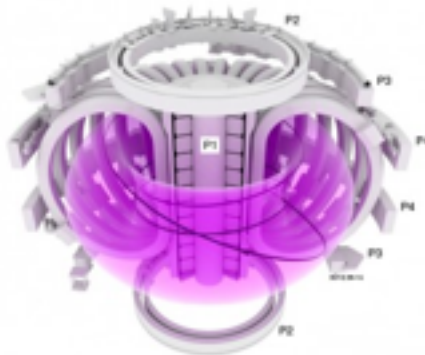
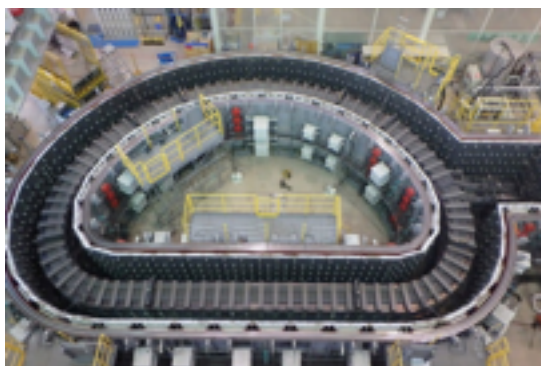
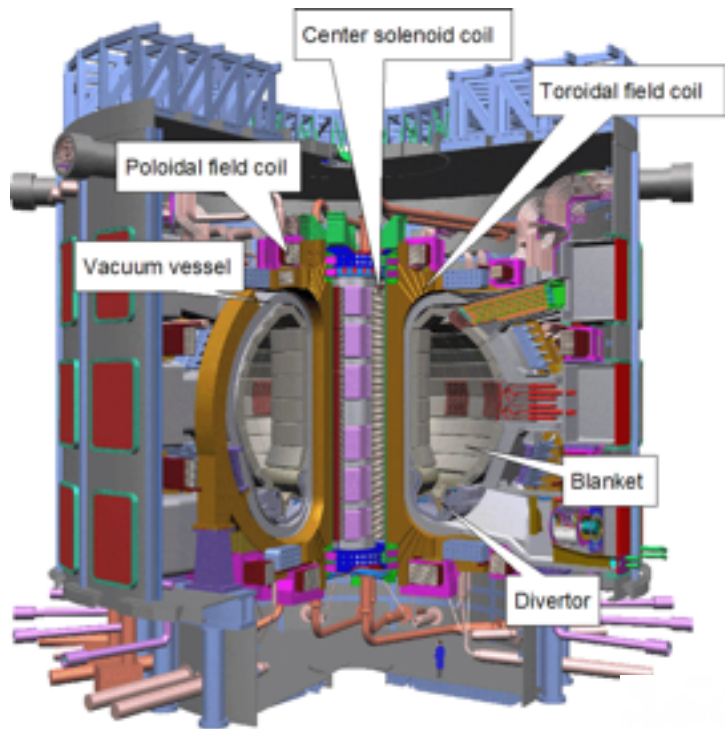


Upgraded cathode support



ITER: International Thermonuclear Experimental Reactor

<http://www.iter.org>



This huge international effort takes place at Caradache (France)

Plasma processing of materials

- Low temperature plasmas are weakly ionized gases where ions constitute free radicals ready to produce chemical reactions with the environment.
- Most applications require of plasmas at atmospheric pressure for surface treatment and processing of materials.
- Plasma activated surfaces exhibit novel and surprising properties.
- Atmospheric plasmas constitute an active research field with a limitless technological and economic potential.

Surface Activation
with Openair® Plasma



Micro-fine Cleaning
with Openair® Plasma

