

CERN ATS seminar on 11/10/2022: <https://indico.cern.ch/event/1205127/>

**Plasma-assisted coatings for applications in ultrahigh vacuum
by André Anders (Leibniz Institute of Surface Engineering (IOM), Leipzig, Germany)**

**Number of participants: ~25 persons in the Council Room + a maximum of 25 persons
connected (webcast)**

A recording is also available on the indico site

The seminar was structured in 3 parts:

Part 1:

A presentation of the Leibniz Institute of Surface Engineering (IOM) was first provided, with the four Research Departments (ultra-precision surfaces; barrier and precision coatings; biocompatible and bioactive surfaces; surfaces of porous membrane filters) as well as the incubator (for explorative projects). The material characterisation and analysis of surfaces, crystalline solids, properties are also key aspects, which must be studied and analysed. The domains covered are R&D as well as industrial applications. Examples of main industrial applications: lithography industry, membranes for water and other filtering.

Part 2:

A wide and exhaustive presentation of the plasma-based coatings, focused on accelerators applications, was then presented. It covered:

- Introduction to plasma-based deposition techniques
 - by evaporation
 - by ion-beam assisted evaporation
 - by magnetron sputtering
 - by cathodic arcs
 - by filtered cathodic arcs
- Non-evaporative getter (NEG) coatings
- Cu and CuO coatings – high emissivity coatings
- Coatings for RF windows
- Some other curious points

The basic functioning of all these processes was discussed, highlighting the key aspects, process parameters and results.

A historical review was also provided, describing the first examples for the technology presented (some of them referring even to 1852 with Grove: 1st hygroscopic getter, and to 1922 with Budd & Ledwinka Patent for getter effect “...for exhausting said chamber of its oxidising air...”).

Part 3:

Other applications based on plasma techniques were briefly presented (100kV CEBAF high voltage insulator; ion beam space charge compensation by a self-pumping plasma).

The **Q&A** session included mainly technical questions, raised by TE/VSC and SY/RF colleagues, on the details of the plasmas and other coating processes and techniques.

Alessandro, Elias, Michele, Thierry (and André)