Thesis projects for chemistry students (BSc and MSc)

Dr. Irene Tagliaro, Prof. Carlo Antonini

SEFI Lab
Surface Engineering and Fluid Interfaces

18th January 2023

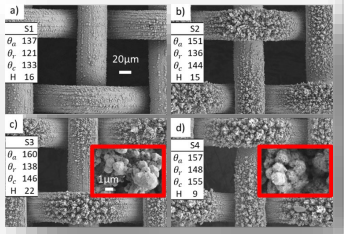
SEFI Lab reserach pillars

Non-wetting
& icephobic
surfaces

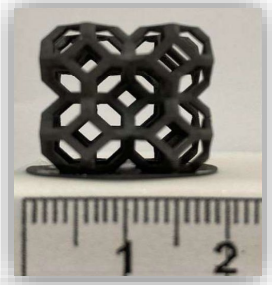
Biopolymers
3D bulk
2D coating
capillary electrophoresis

Wastewater treatment
of domestic appliances

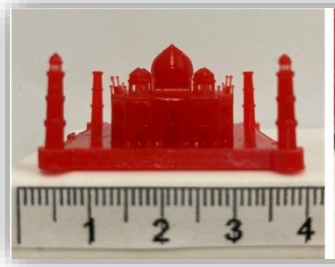
plasticpollutioncoalition.org



SEFI Lab



3D printing
DLP (digital light
processing)



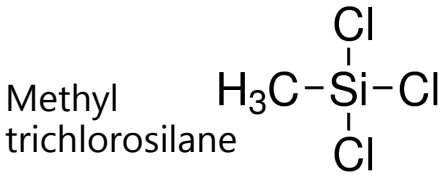
SurfICE

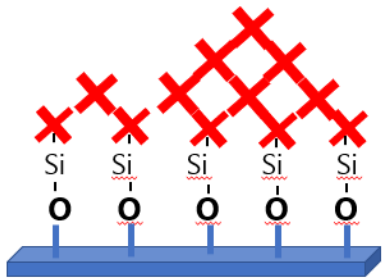
surfice-itn.eu
(2021-24)

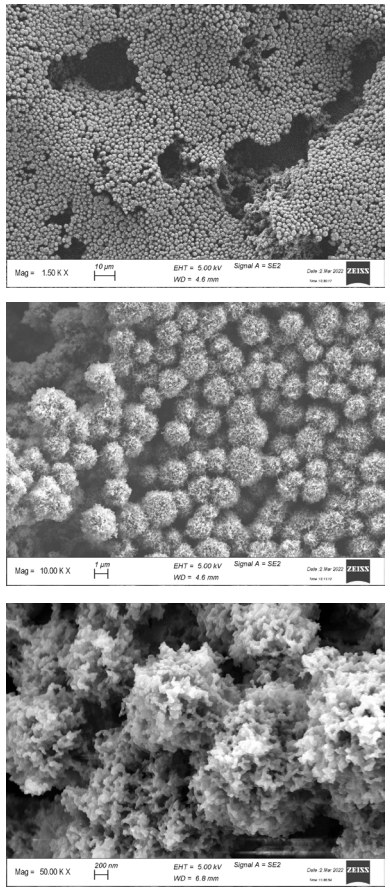
From superhydrophobic to icephobic surfaces

Superhydrophobic

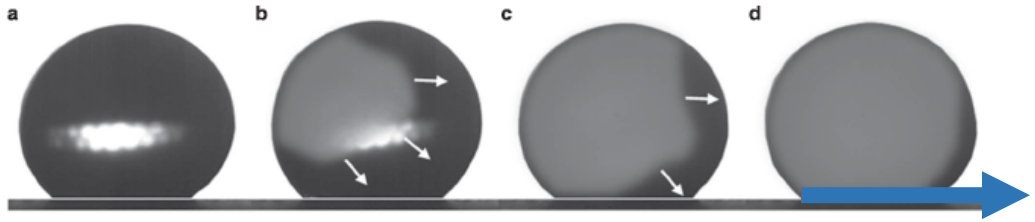
Methyl trichlorosilane







Icephobic



Jung et al., Nat Comm (2012)

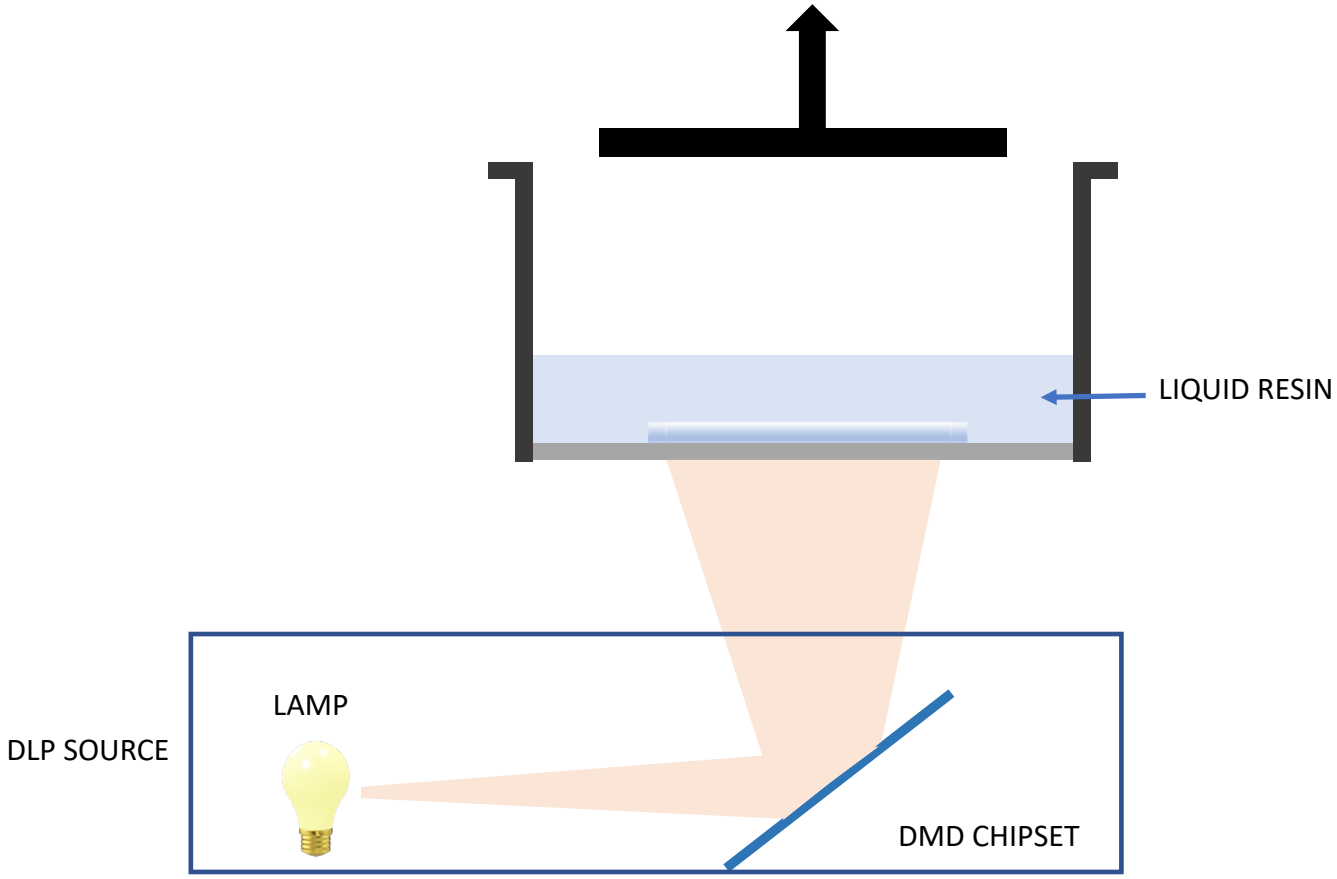
Adhesion force

SurfICE

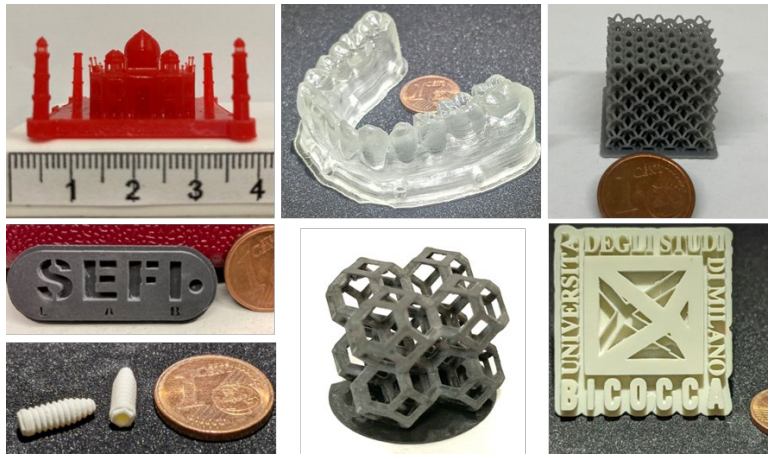
EU project: www.surfice-itn.eu
(2021-2024)
Coordinated by UNIMIB

3D printing by photopolymerization

Digital light processing (DLP) → layer-by-layer



pure resins



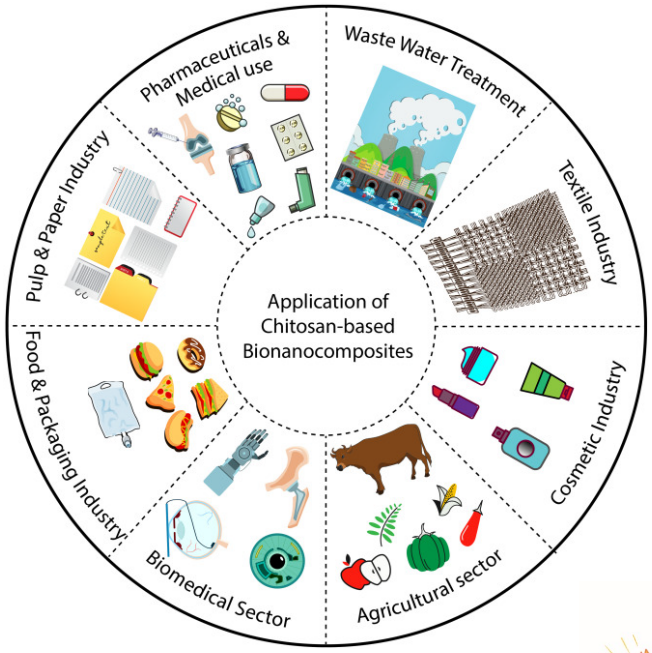
metal

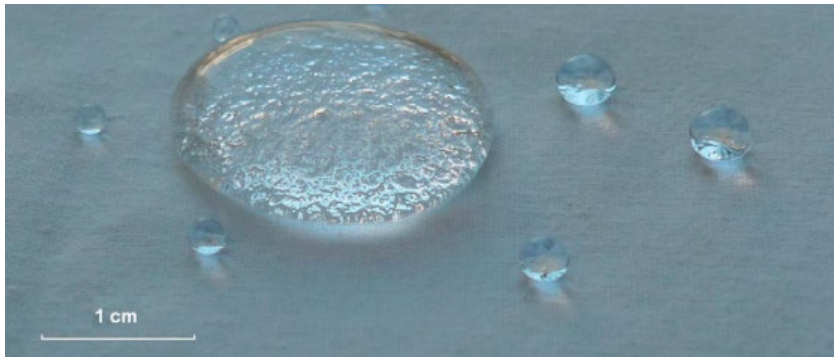
ceramic

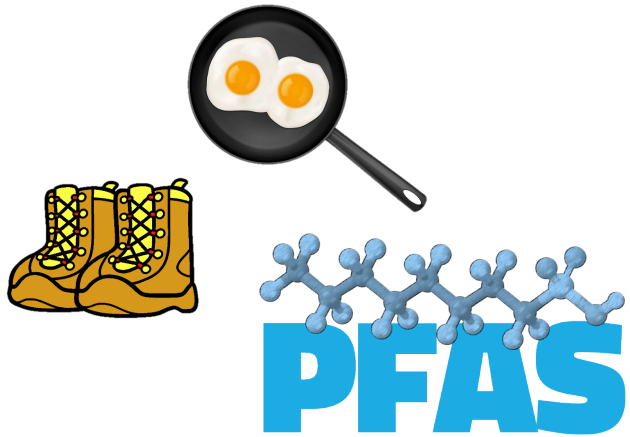
Superhydrophobic coatings

INTERNAL

Chitosan

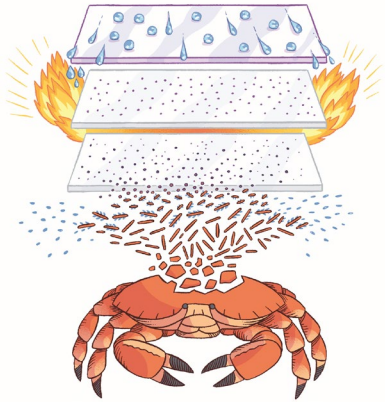


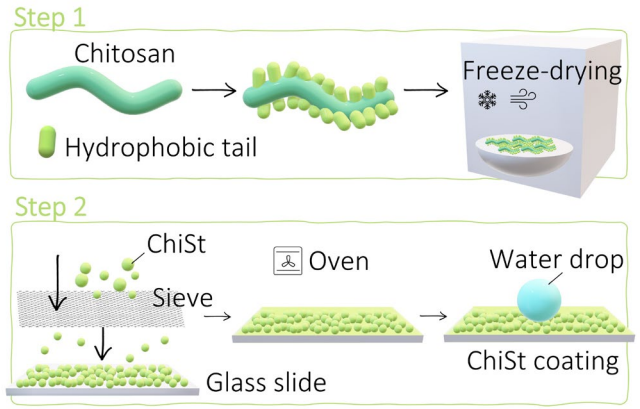


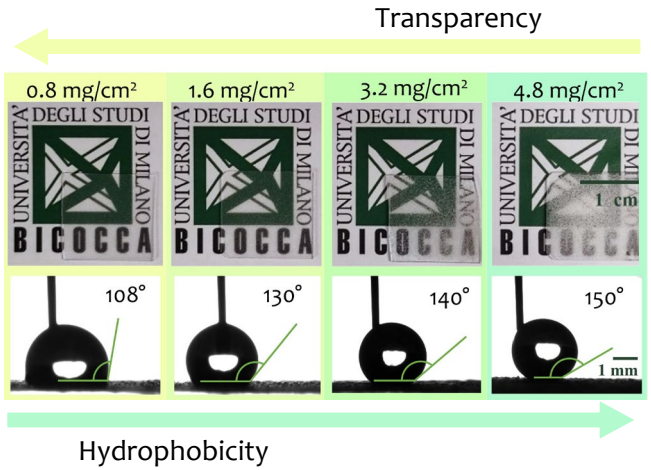


Chemical modification of the functionality

Deposition of coatings





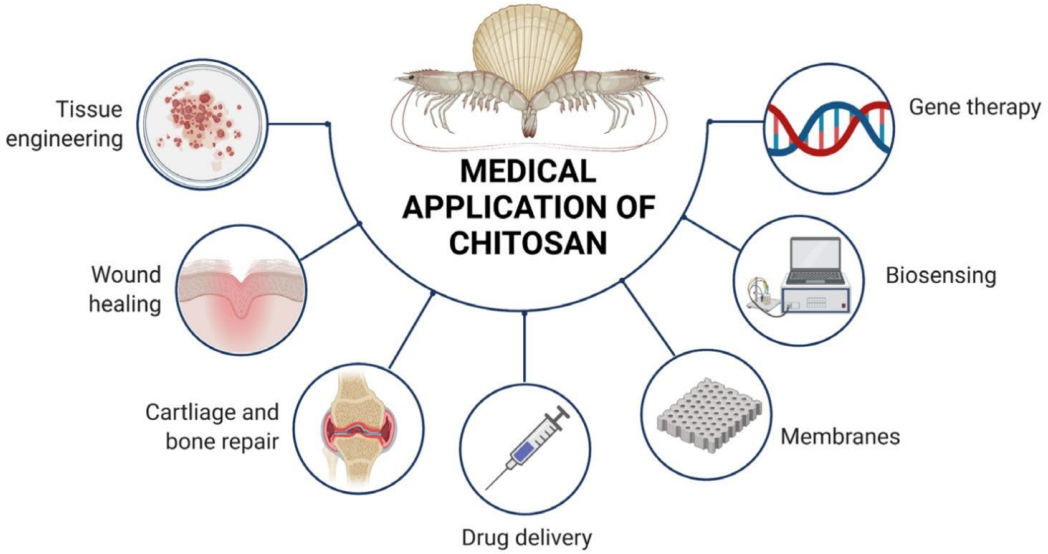


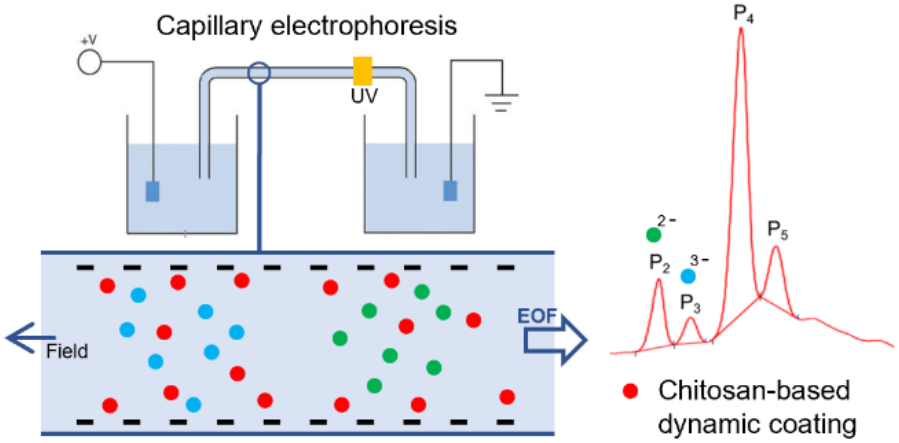
EXTERNAL

Ronzoni

ISTITUTO · G. RONZONI
CHEMICAL AND BIOCHEMICAL RESEARCH
NONPROFIT RESEARCH FOUNDATION

- Chemical modification of chitosan functionality
- Industrial applications in medical ad pharmaceutical fileds
- Forensic application in collab. with University of Verona





EXTERNAL
(ERASMUS)

Bio-aerogels

Cemef CNRS UMR 7635

Host:
Tatiana Budtova, CEMEF, France

- Bio-aerogels
  - dry
  - highly porous
  - nanostructured
  - polysaccharide materials
  - attractive as biomaterials

Cellulose aerogel precursor | Cellulose aerogel | Cellulose cryogel | Cellulose xerogel

Budtova, Cellulose 26, p. 81–121 (2019)

- Thesis project:
  - Preparation by supercritical (CO_2) drying
  - Drug incorporation
  - Assessment of drug loading and release
  - Study of processing-structure-properties relationship.

Gradient Polymers via iCVD

EXTERNAL (ERASMUS)

Host:
Anna Maria Coclite, TU Graz, Austria

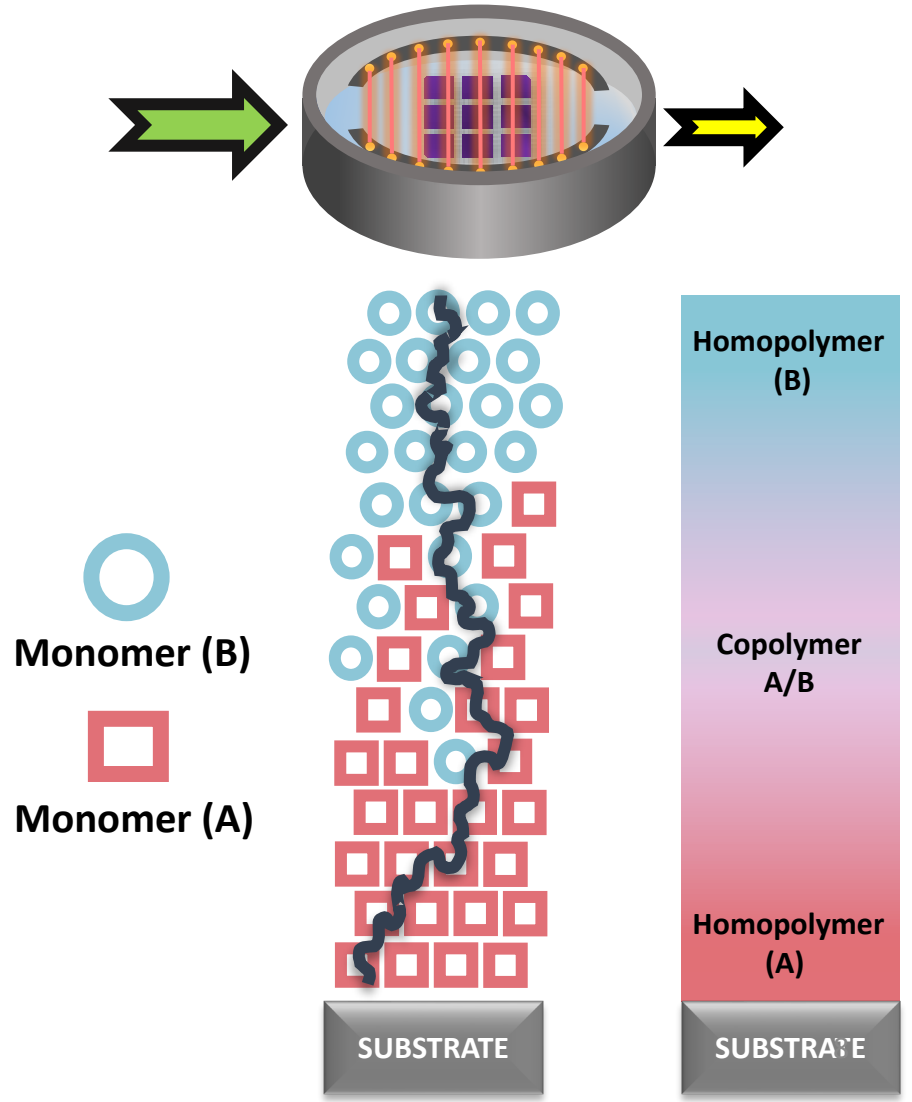
Initiated Chemical Vapor Deposition

- One-step process (*No pre-/post treatment*)
- No solvents required
- No waste/no side reactions
- Scalable (*Industrial applications*)

Gradient polymer

→ Continuous structure with a progressive conversion from species A to B

→Monomers properties are 100% retained



Contacts

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Feel free to contact us via email to set an appointment

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