



# CELL 241: Superhydrophobic hybrid paper sheets with Janus-type wettability

**Theme:** Chemistry for New Frontiers

## Authors

Simon Trosien (/acsorlando2019/speaker/d912577ad401b97b8e771947c02302eb)

Cagla Kosak Soz (/acsorlando2019/speaker/8f71b301b3e360c8d1419c9d2ec84cab)

Markus Biesalski (/acsorlando2019/speaker/ed7cf2e5a488ba06d6d19bdb40026c7c)

## Body

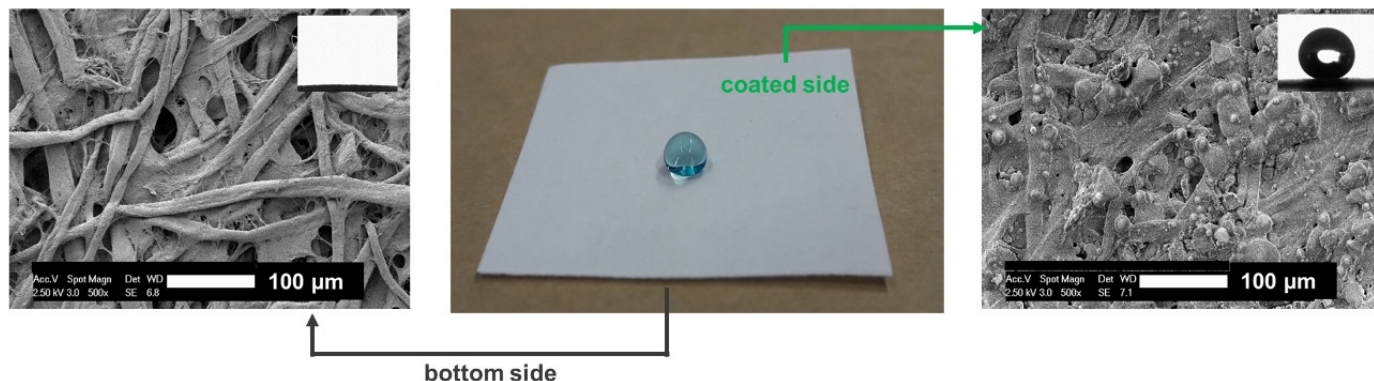
**Cagla Kosak Soz**<sup>1</sup>, Simon Trosien<sup>2</sup>, Markus Biesalski<sup>2</sup>

1. Materials Science and Technologies, Turkish German University, Istanbul, Turkey

2. TU Darmstadt Makromolekulare Chemie und Papier Chemie, Darmstadt, Germany

Hybrid paper sheets, paper based materials composed of organic and inorganic constituents, with Janus type wetting properties were prepared. One side of the sheet was superhydrophobic whereas the untreated side preserved its hydrophilicity, as shown in Figure 1. A thin coating composed of cross-linked poly(dimethyl siloxane) (PDMS) and inorganic particles of various sizes ranging from nanometers to several tens of micrometers was applied both onto the Whatman No. 1 filter paper and lab-engineered cotton linters-based paper substrates. Hybrid sheets with high chemical durability, mechanical stability, and flexibility were achieved due to the covalent attachment of the particles to paper fibers and the inherent elasticity of PDMS chains. They remained porous and permeable to gases. Moreover, they had liquid directing and confinement ability due to the gradual change in chemistry between the two sides exhibiting a dramatic wetting contrast. All of these properties make Janus type hybrid paper sheets potential candidates as wound dressings and/or bandages.

**Figure 1.** Lower untreated side of the hybrid paper sheet preserves the fibrous morphology and inherent hydrophilic behavior, whereas the coated upper side gains a different multiscale topography and becomes superhydrophobic.



## Presentation Details



### CELL 241: Superhydrophobic hybrid paper sheets with Janus-type wettability

Monday, Apr 1 8:05 AM

Room W304D, Orange County Convention Center

(/acsorlando2019/event/72fb2bef33bdc9c0d66ee69c52c2f0ff)