

## **Droplet Wetting and Evaporation: From Pure to Complex Fluids**

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In the early 1800s, Thomas Young and Pierre-Simon Laplace conducted the first investigations on the wetting of droplets. They investigated the wetting issues, the role of the contact angle and the liquid/solid coupling nature driving the droplet problems. While a sessile droplet is a simple geometry, it is also a complex system to solve for real life situations (metallic inks for inkjet printing, spreading of pesticides on leaves, drops of whole blood or blood serum spreading and drying for medical applications). By taking into account its wetting and then its evaporation, this simple case becomes a very complex problem that is researched by several teams worldwide. The complexity is mainly due to the physics involved, the full coupling with the substrate on which the drop sits (the Latin root of the word sessile means "on which one can sit"), the atmosphere and the fluid nature (pure fluid, bi- or multi-phases or even containing colloids). Today, the research area of "droplet" and "evaporation" is the subject of more than 6700 papers published in the past 50 years (1964-2014) in referenced journals archived in the Scopus database. Because the total number of scientific publications also sharply increased in the same period for all areas of research in "Life, Health and Physical Sciences", the results were normalized and clearly show a linear increase in percentage of the literature of the scientific community. The number of publications dealing with "droplets" and "evaporation" has been multiplied by a factor 10 during the last 50 years. Several domains are concerned by this increase in publications. The distribution in 2014 shows a strong interest in engineering of more than 40%, fundamental physics and chemistry of 27%, material science of 10%, and energy of 7%. The energy area is covering an increasing part of published papers dealing with "droplet" and "evaporation," especially because of the applications (printing of complex fluids, spray cooling, DNA analysis...). In this keynote, I will present the different research topics dealing with droplets that have been studied and which are right now studied in different teams worldwide.