

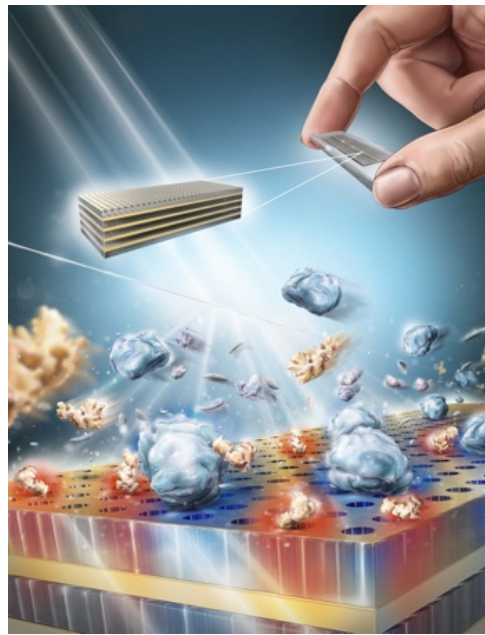
# ***Crossroads Between Photonics and Biology: The Next Big Thing will be at the Nanoscale***

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The crossroad between nanoscience and biology is becoming one of the most relevant and fertile research fields of the last decade, where light-matter interaction is harnessed at the single nanometer scale for cellular explorations, high-resolution imaging and advanced nanotherapies. This talk will review how we harness and control the interaction between light and matter at this scale by engineering artificial functional nanomaterials with fascinating extreme optical properties. Extreme optics of hyperbolic dispersion and Epsilon-Near-Zero materials unlocked new physical phenomena opening the way for virtually infinite photonic density of states, anomalous wave propagation and ultrahigh confinement of electromagnetic fields. This has led to speed up and control of the spontaneous emission of quantum emitters and to engineer ultrasensitive bulk plasmon polaritons for biosensing applications.



**Figure 1:** *Nanobiosensor based on hypergratings supporting bulk plasmon polaritons.*

## **References**

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