

# (CURRENT, PAST, FUTURE) PROJECTS ON SENSING

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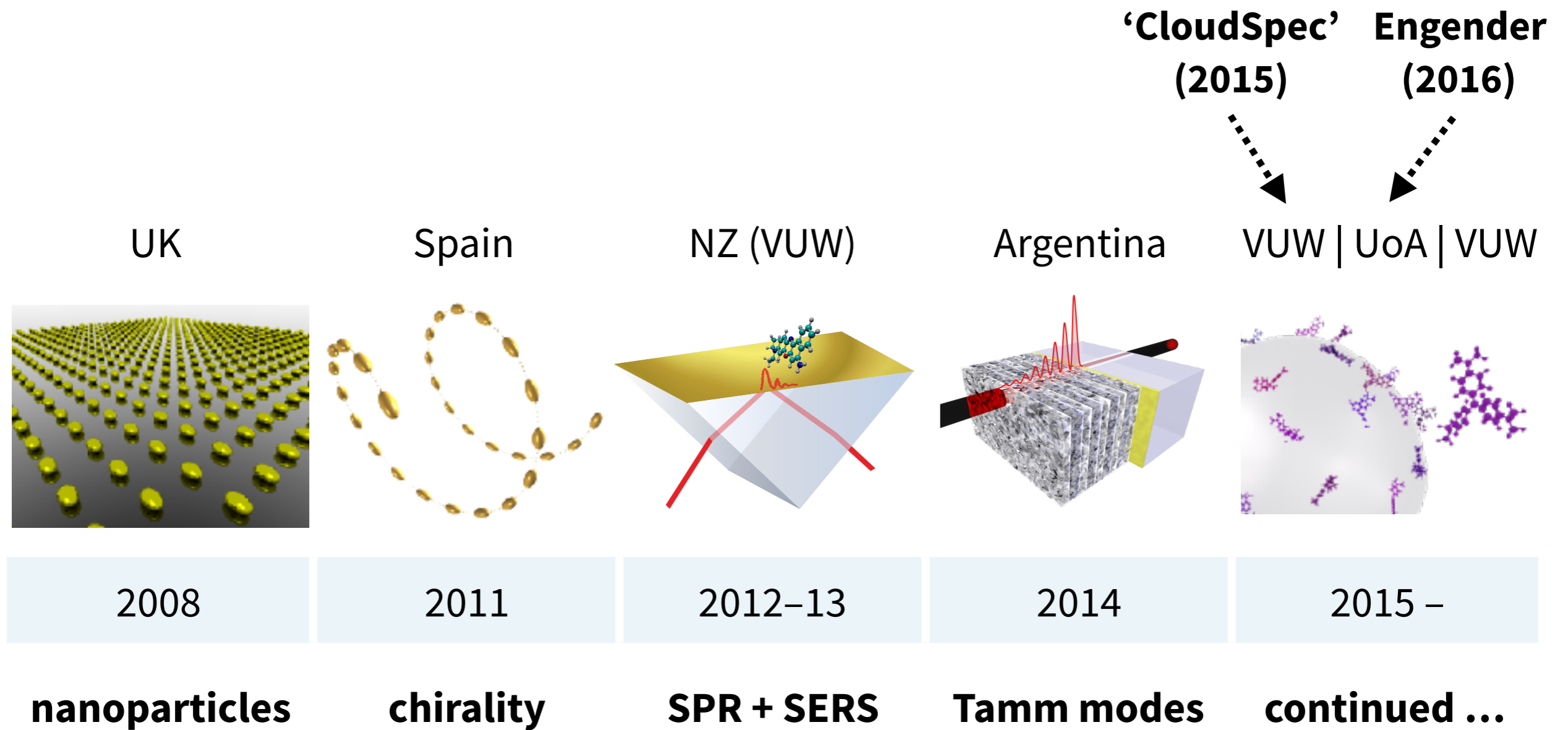
Baptiste Augu  

Victoria University of Wellington



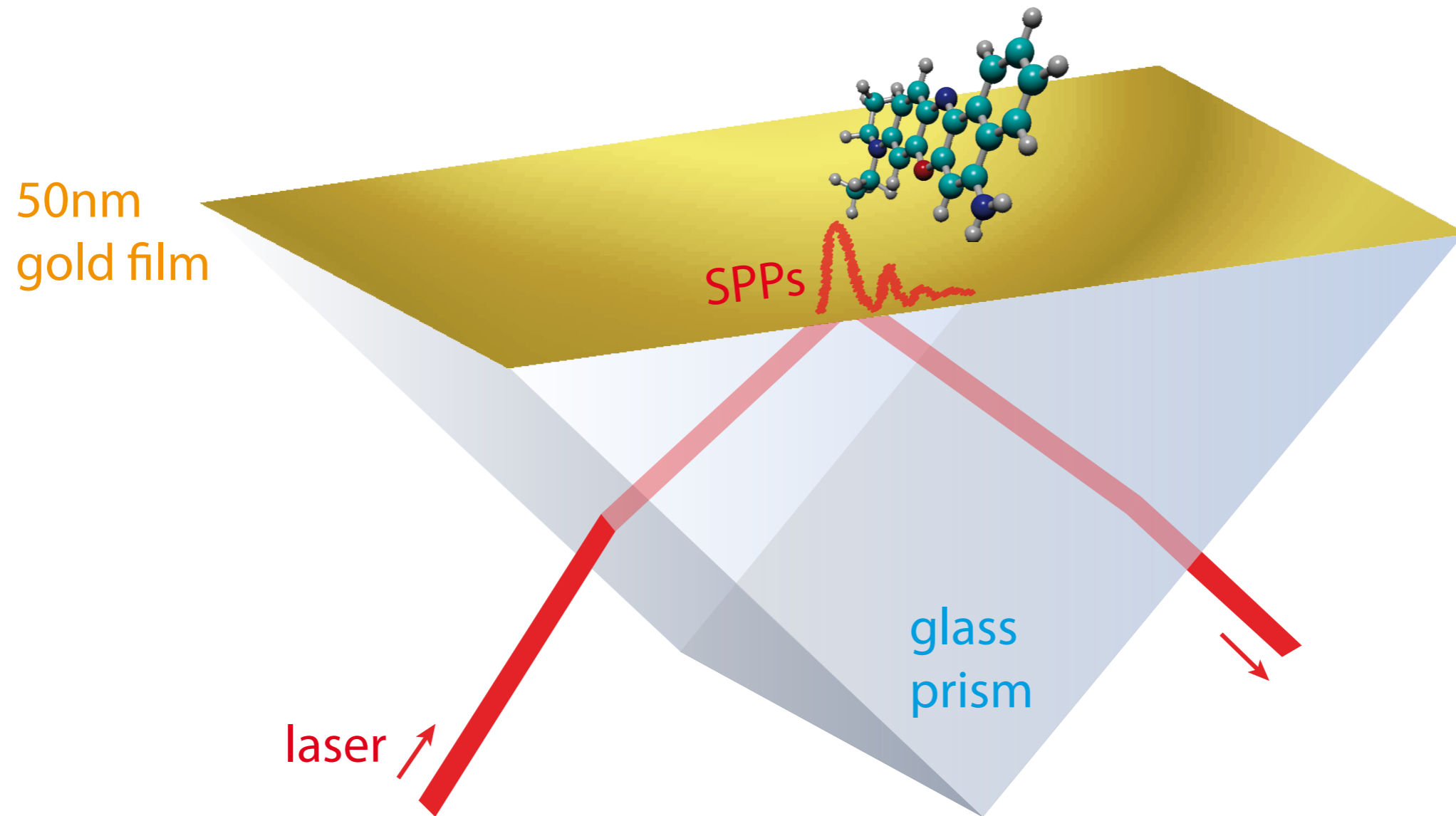
# SENSING-RELATED PROJECTS

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# BACKGROUND: PLASMONICS

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# SURFACE PLASMON RESONANCE

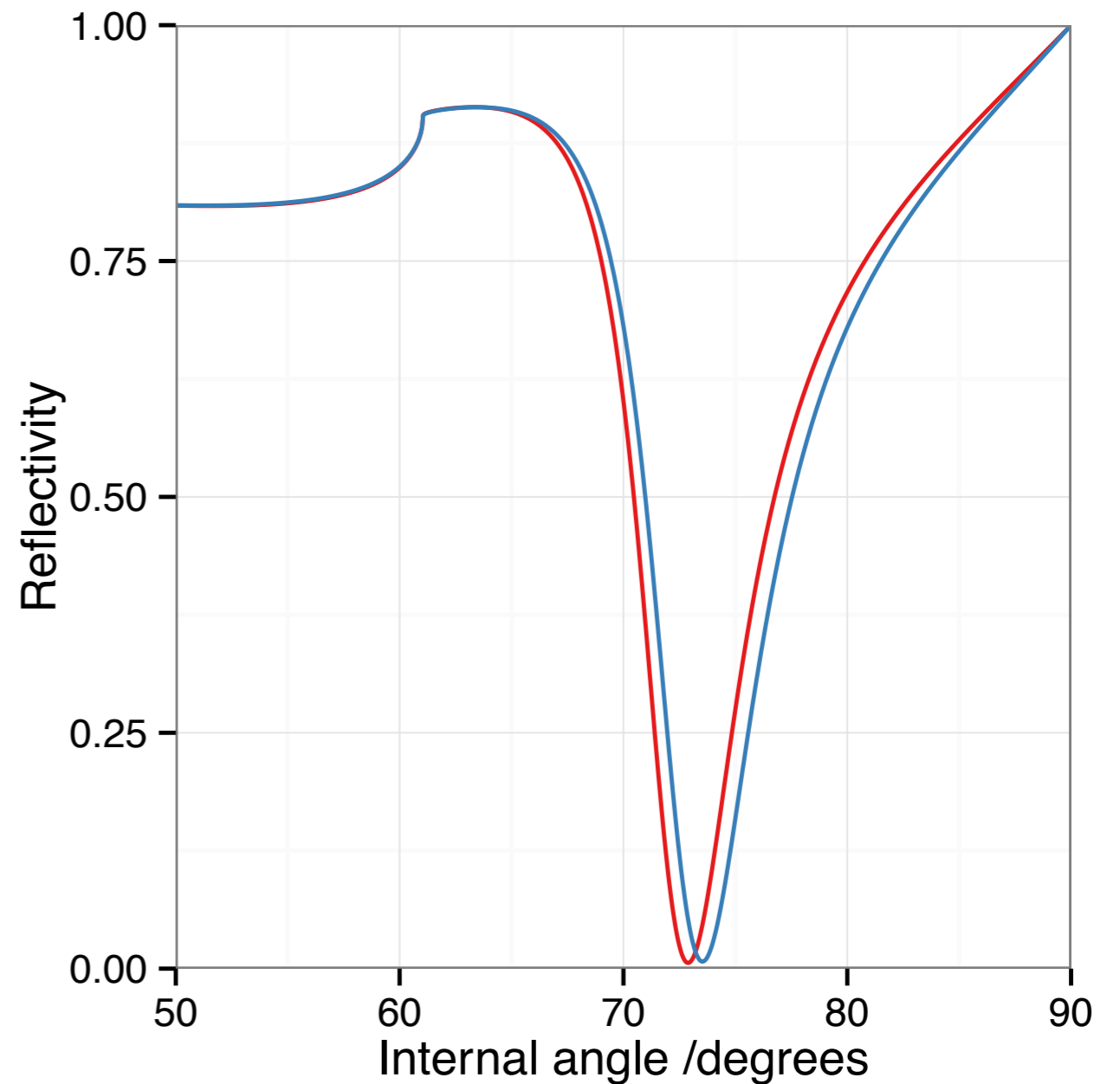
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$$k_{\text{spp}} = k_0 \sqrt{\frac{\epsilon_d \epsilon_m}{\epsilon_d + \epsilon_m}} \\ = k_0 n \sin(\theta)$$

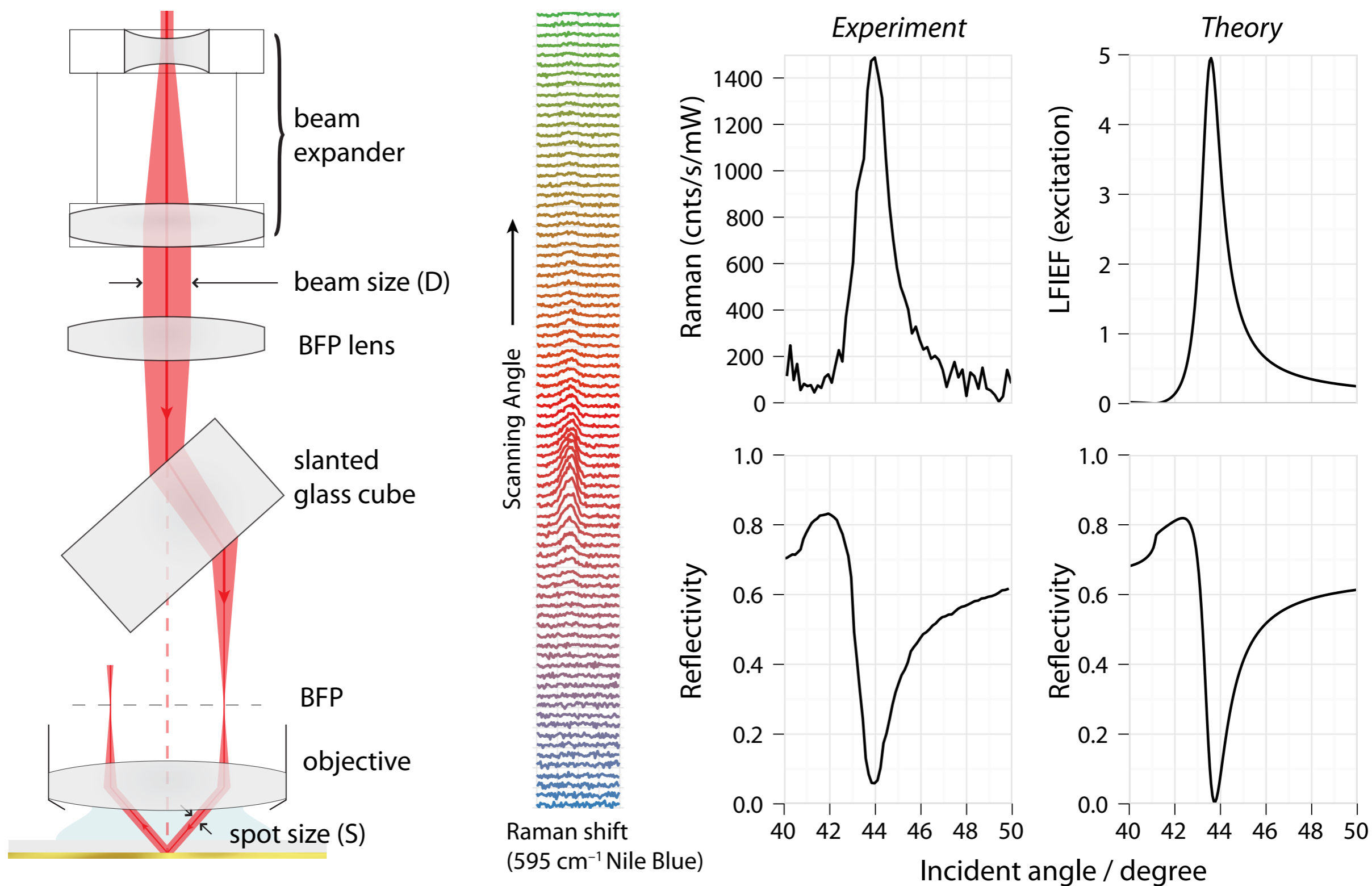
State-of-the-art:

$\sim 10^{-7} \text{ RIU}^{-1}$

$\sim 0.1 \text{ ng / ml}$

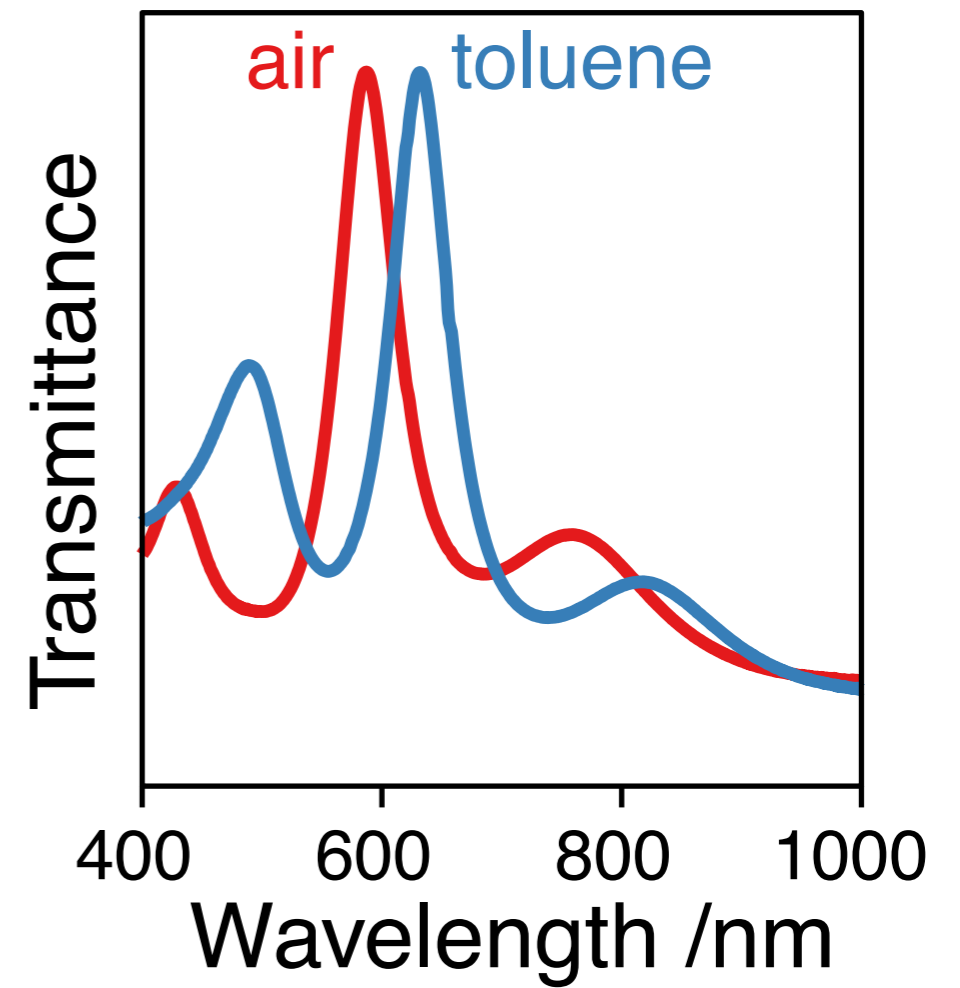
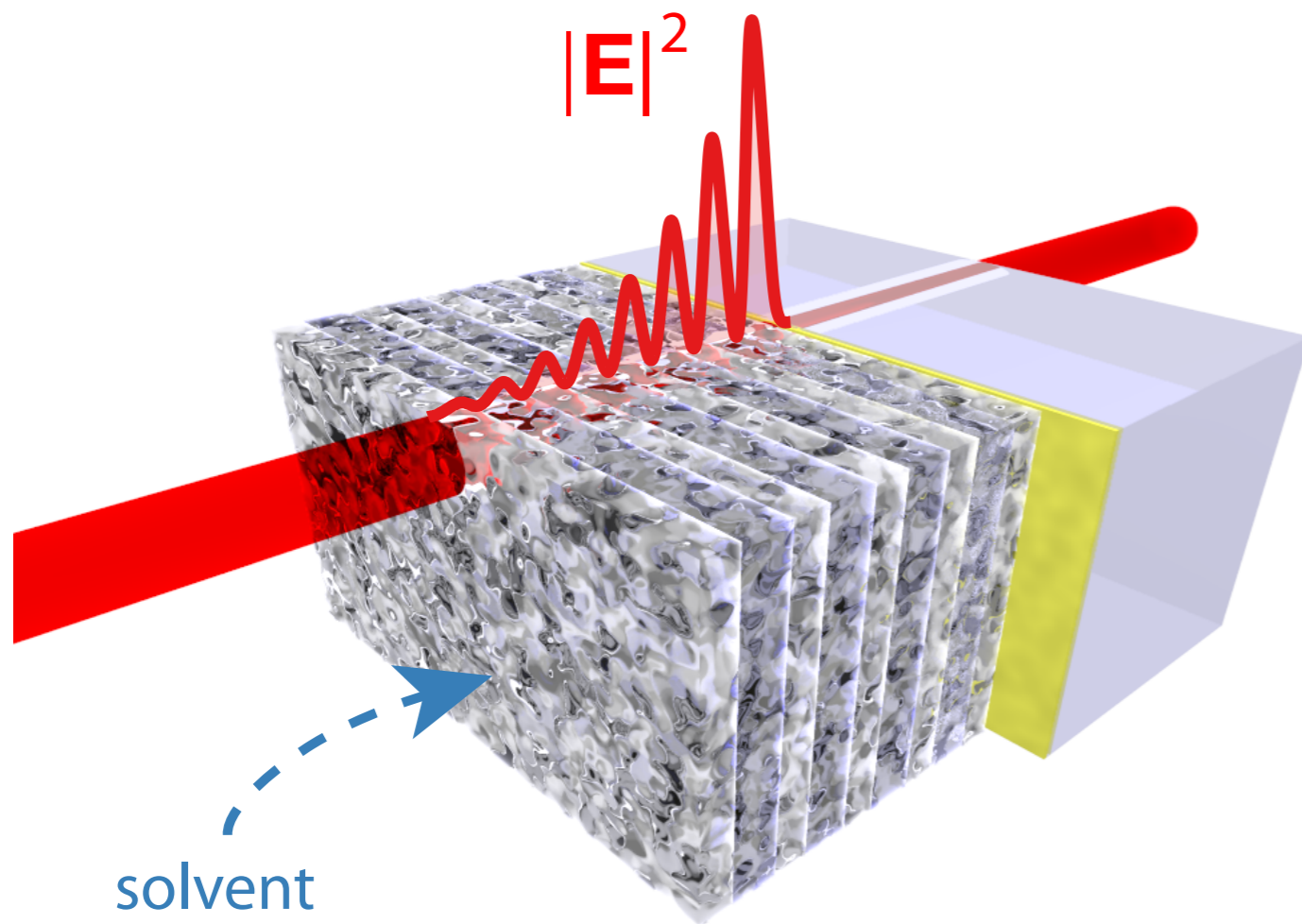


# COMBINING SPR AND SERS



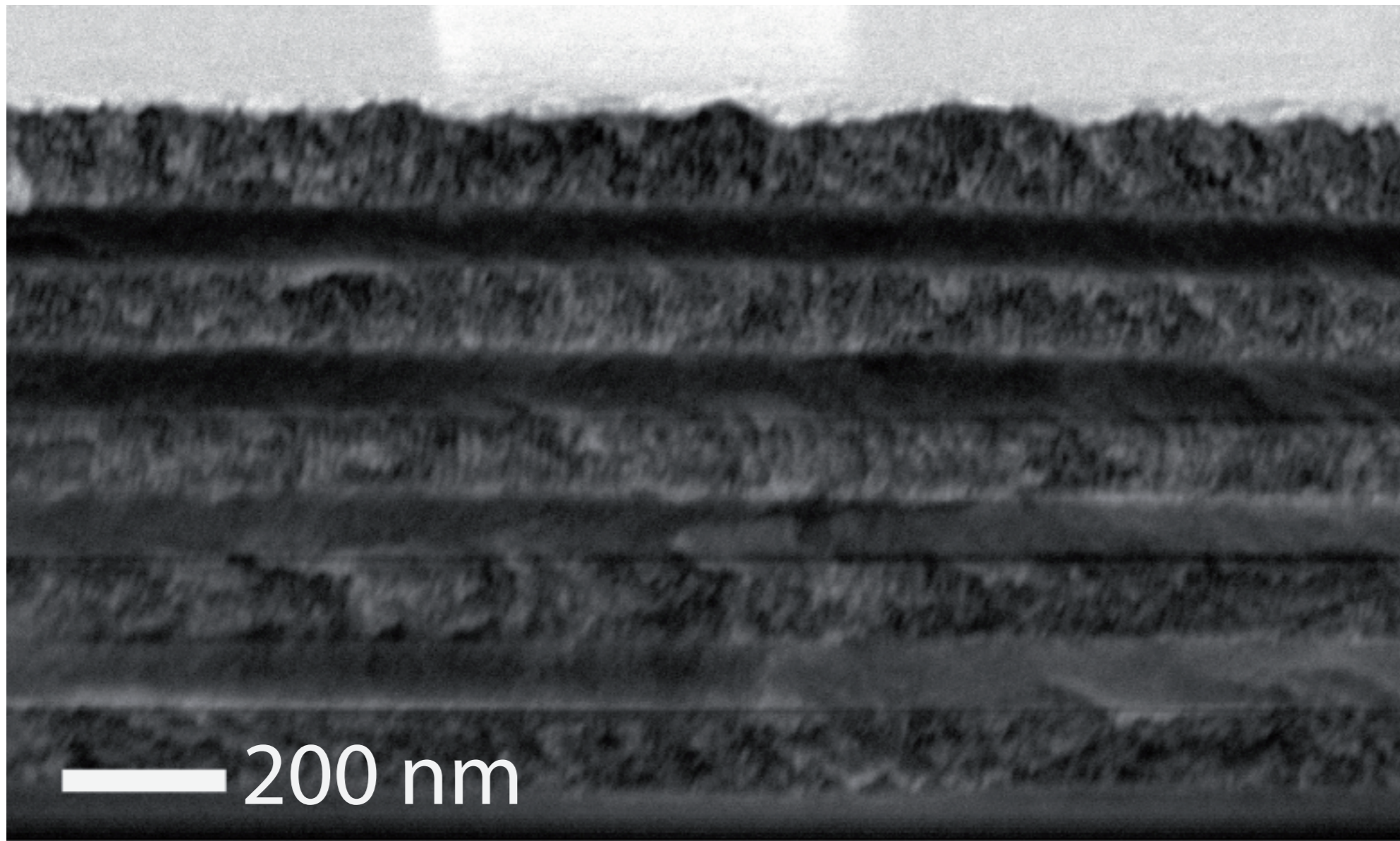
# TAMM PLASMONS

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# TAMM PLASMONS

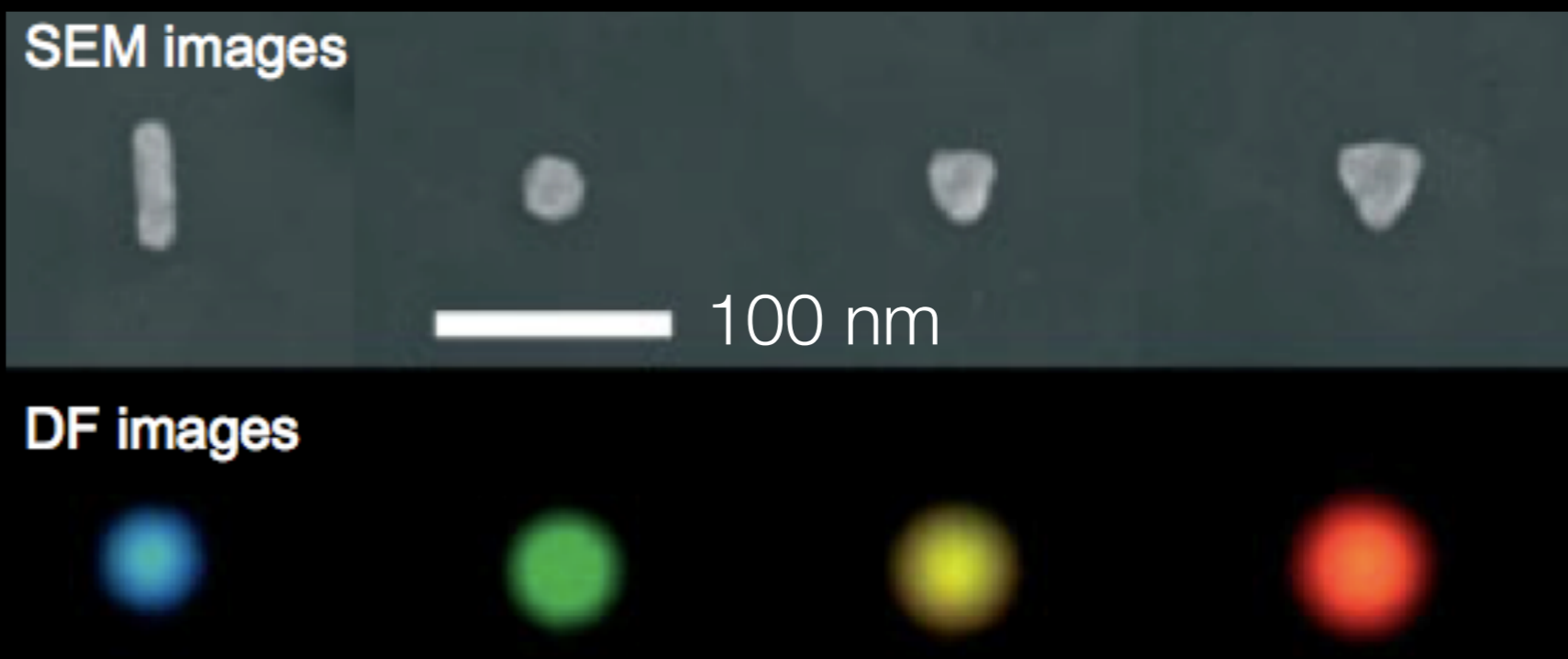
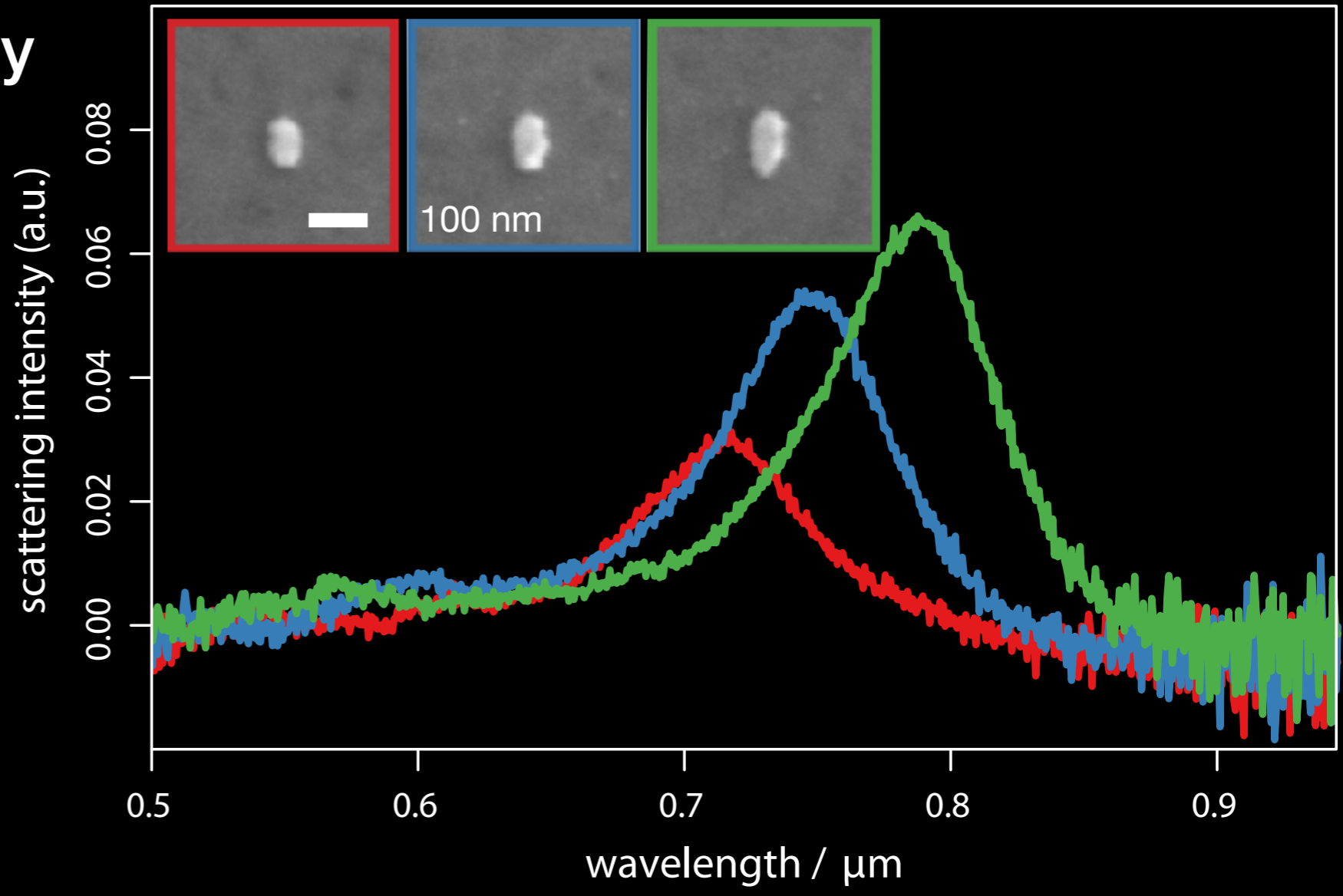
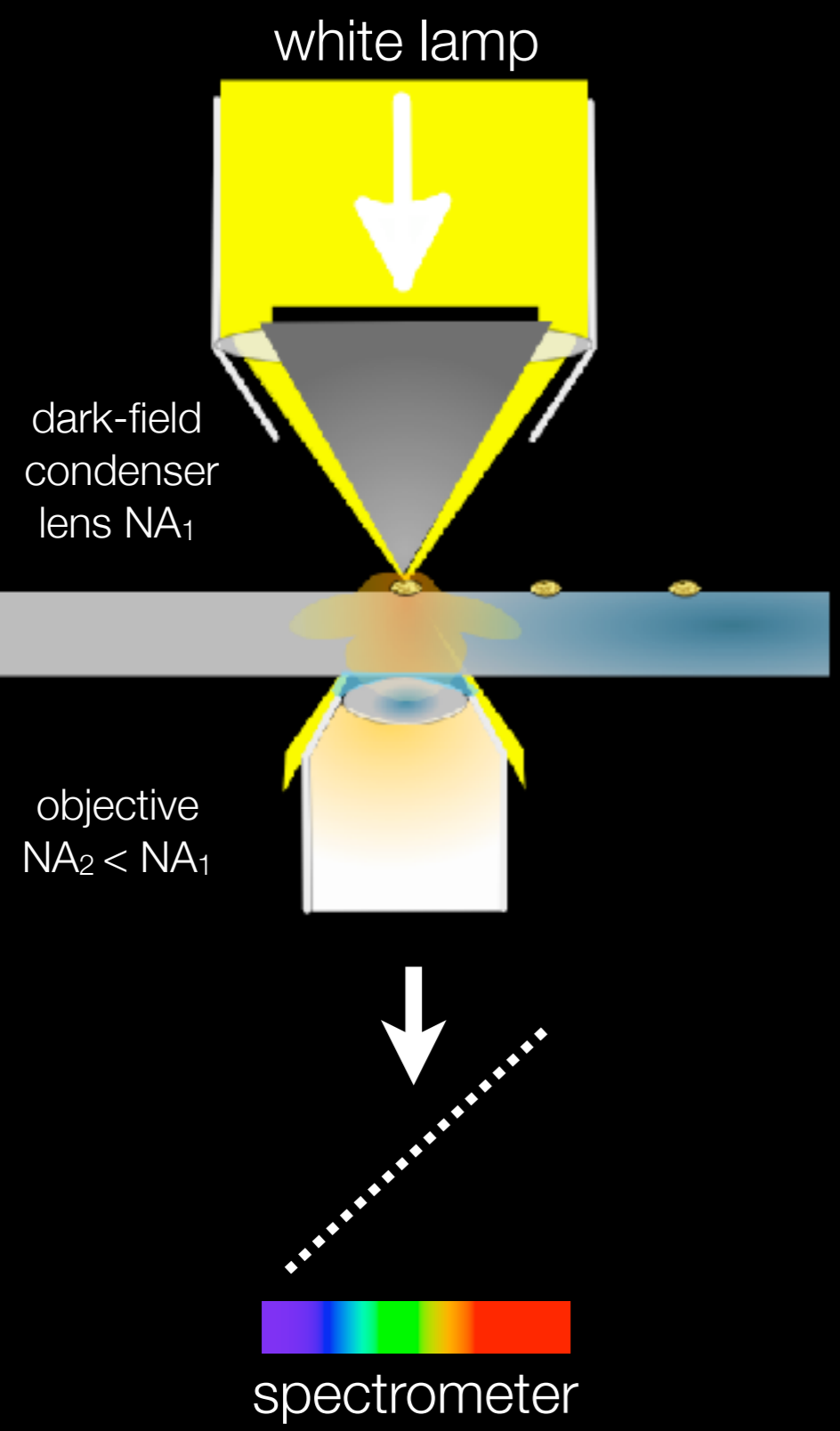
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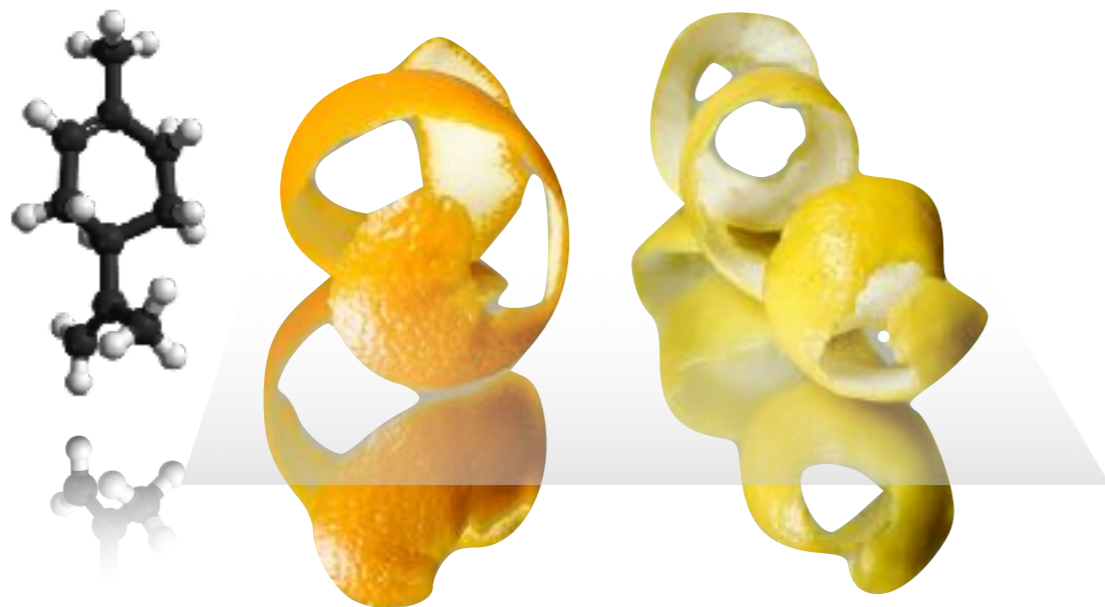
*Au* 23 nm  
*TiO<sub>2</sub>* 100 nm  
*SiO<sub>2</sub>* 82 nm  
*TiO<sub>2</sub>* 102 nm  
*SiO<sub>2</sub>* 79 nm  
*TiO<sub>2</sub>* 98 nm  
*SiO<sub>2</sub>* 82 nm  
*TiO<sub>2</sub>* 104 nm  
*SiO<sub>2</sub>* 72 nm  
*TiO<sub>2</sub>* 115 nm  
*glass*



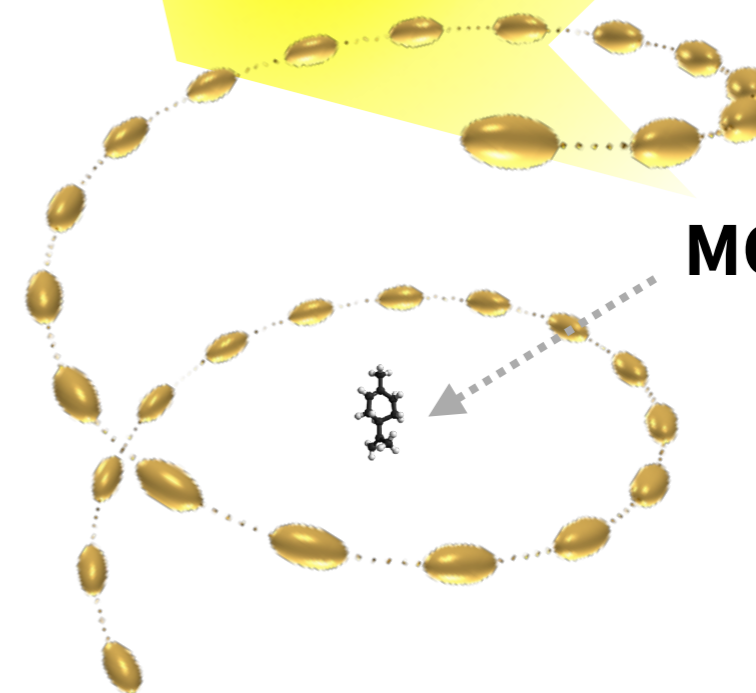
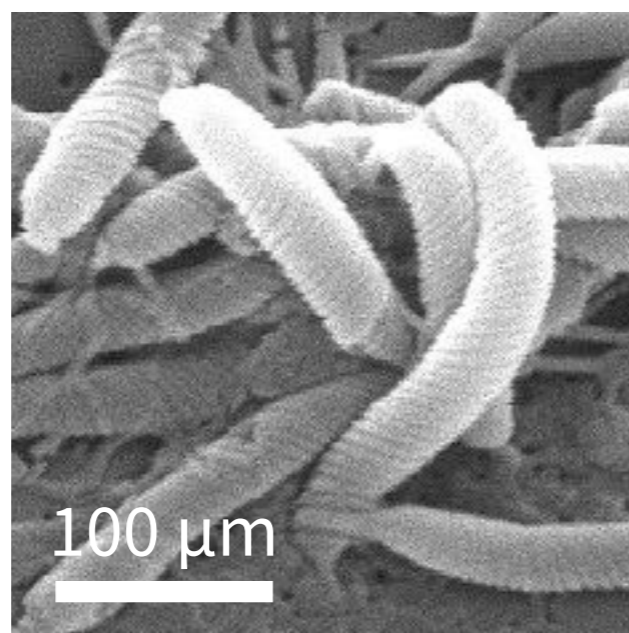
# Dark-Field Spectroscopy



# NEW LINE: CHIRALITY & NANO-ANTENNAE



**LIGHT**  
~500nm



**MOLECULE**  
~1nm

**NANO PARTICLES**

LOOKING FOR STUDENTS

2 PHD PROJECTS

<http://plasmonics.github.io>

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