Emission of light at the nanoscale excited by electric pulses

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"Why bother?"

In most nanophotonic experiments and devices, emitters (e.g. quantum dots) are excited by an external light source (e.g. laser)

Wouldn't it be cool/hot/exciting if quantum dots could be excited & addressed electrically?

Allows to join with the whole world of CMOS, and silicon nanofabrication

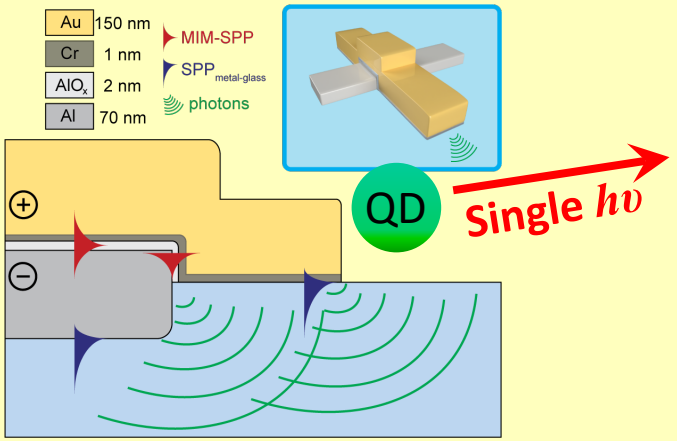
Consider this: you could send single photons at the nanoscale with your phone! :-)

"Beware!" ;-)

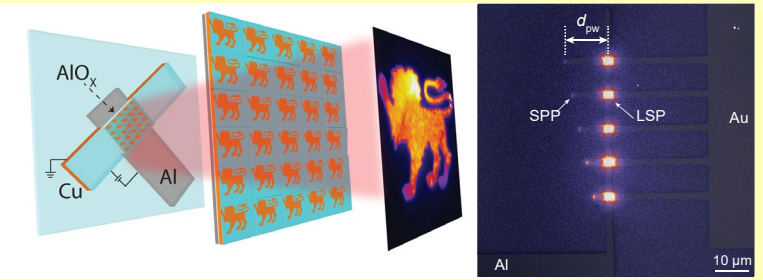
Interdisciplinary project with interdisciplinary team!
No standard student project in 1 group with 1 advisor!
Lots of creativity & own initiative are needed!
Don't worry, we take very good care of our students!

Challenge: how to realize such a device?

Excite **plasmons** on 2 thin **gold** strips
The plasmons excite **quantum dots**
Collect emitted **light**: voilà! (few pitfalls to watch for!)



Proven plasmon excitation in tunnel junctions:



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