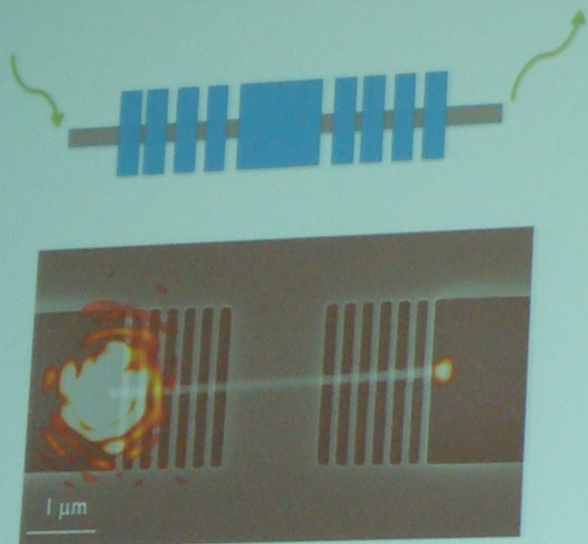
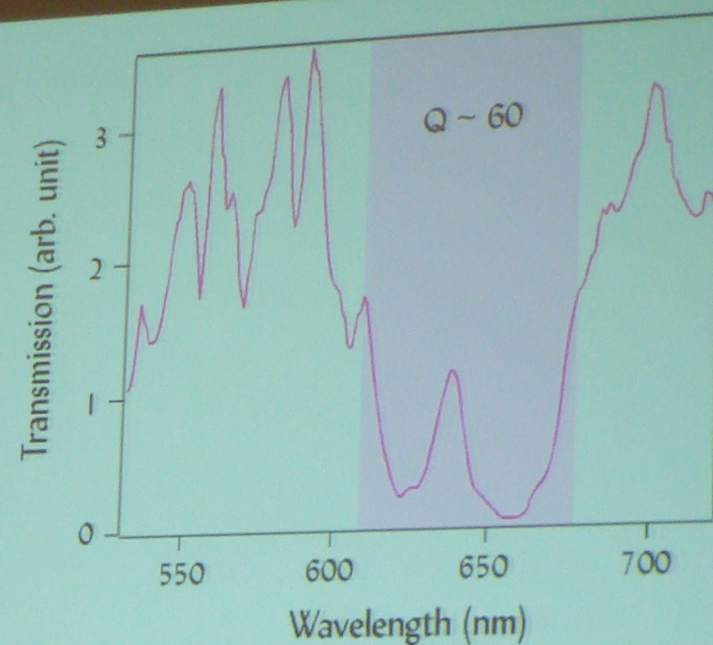
Plasmon Cavity: Data

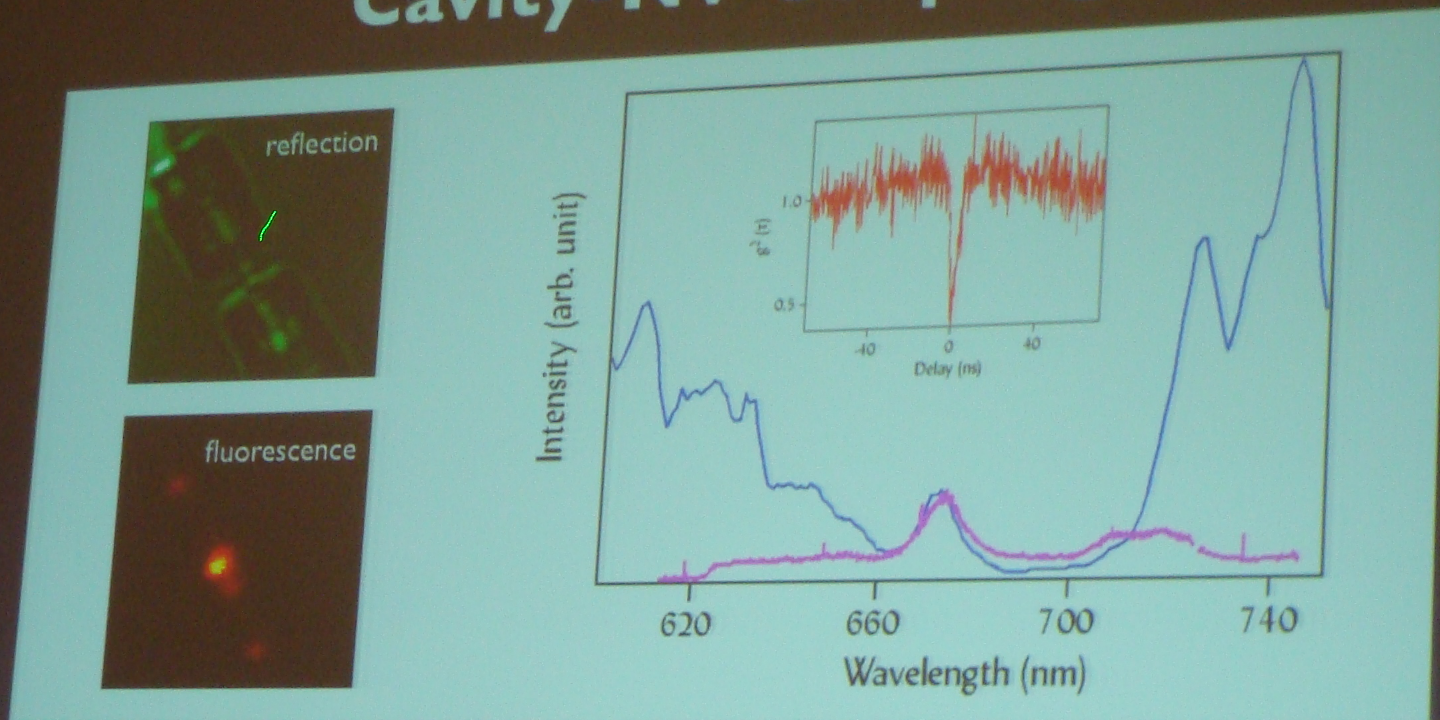




- A plasmon cavity fabricated using an Ag NW and PMMA stacks exhibits a clear resonance inside the plasmon stopband.
- The intensity of the resonance peak is attenuated by material absorption.
- The cavity Q ranges from 40 ~ 90 (finesse: 4 ~ 12).

de Leon et al. submitted (2012)

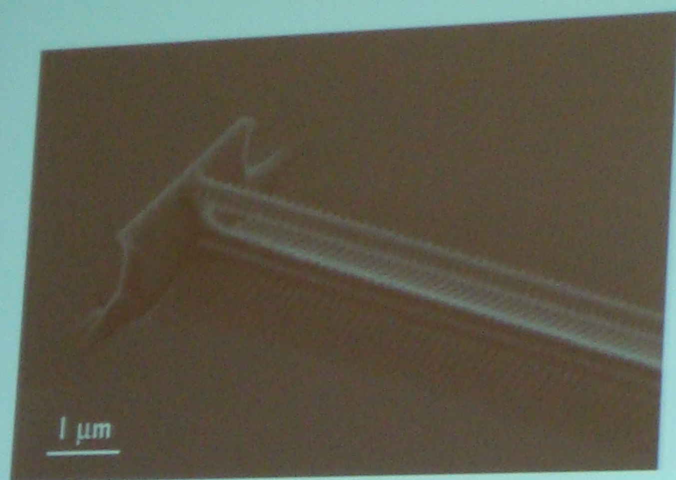
Cavity-NV Coupling

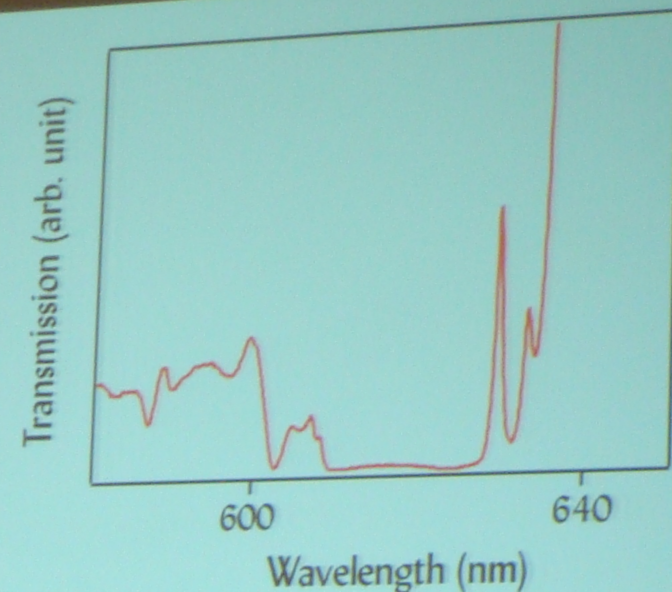


- The **fluorescence spectrum** of a single diamond NV center coupled to the cavity is **modified** from that of an uncoupled one.
- The **Purcell factor** up to **~30** can be achieved when the NW diameter is ~100 nm and Q is around 60.

de Leon et al. submitted (2012)

Diamond Nanobeam Resonator

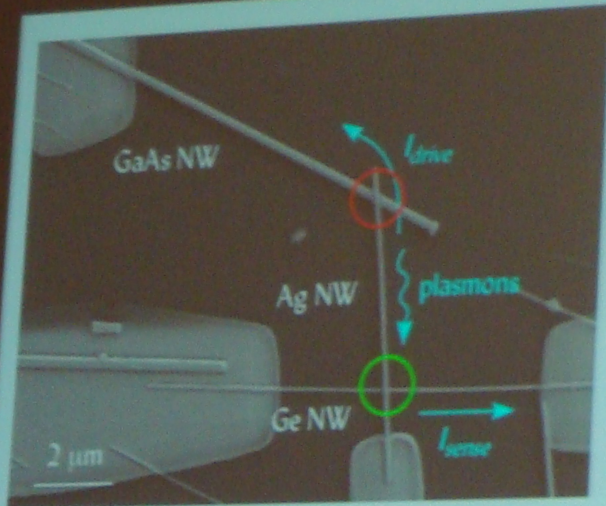


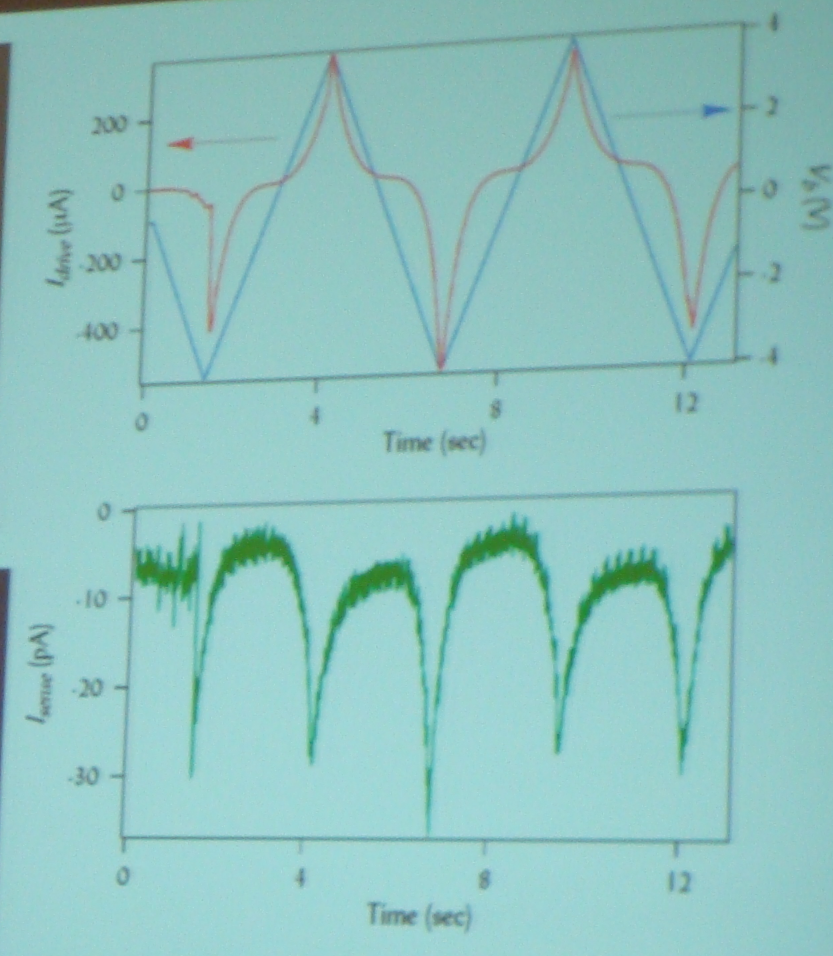


- By creating DBRs directly on an etched diamond nanobeam, we can generate a photonic cavity with Q exceeding 1000.
- By combining this resonator structure with gap plasmons, we should be able to generate plasmon cavities with high Q and exceptionally small V_M.

de Leon et al. (2012)

Dark Optoplasmonic Device

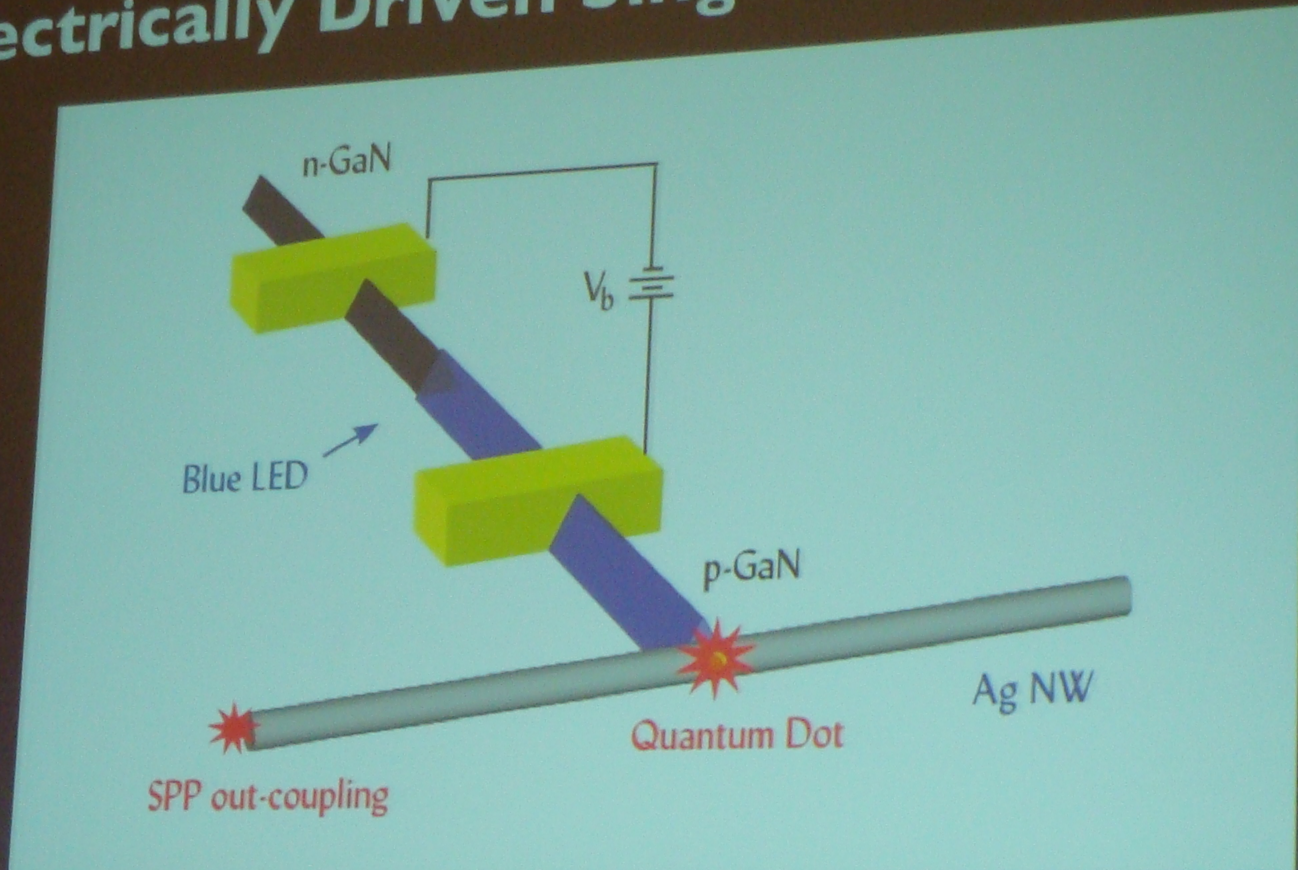




- A double-crossbar structure between NWs can form "dark" optoplasmonic circuit where plasmons are generated and detected electrically.

Yu, Falk et al. (2012)

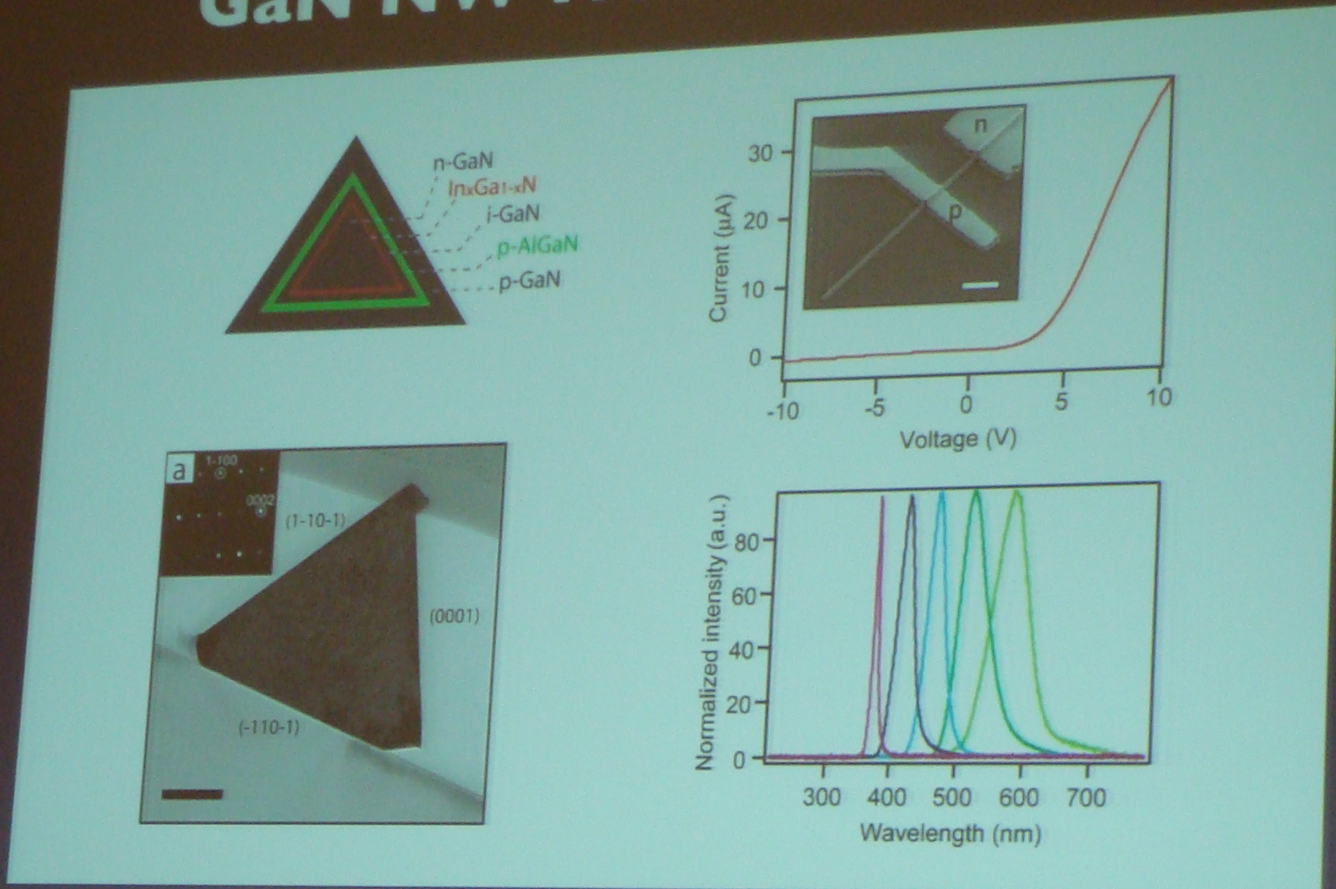
Electrically Driven Single Plasmon Source



- By combining an efficient light-emitting diode (LED), a single quantum emitter, and a plasmonic waveguide, we can fabricated an electrically driven single plasmon/photon source.

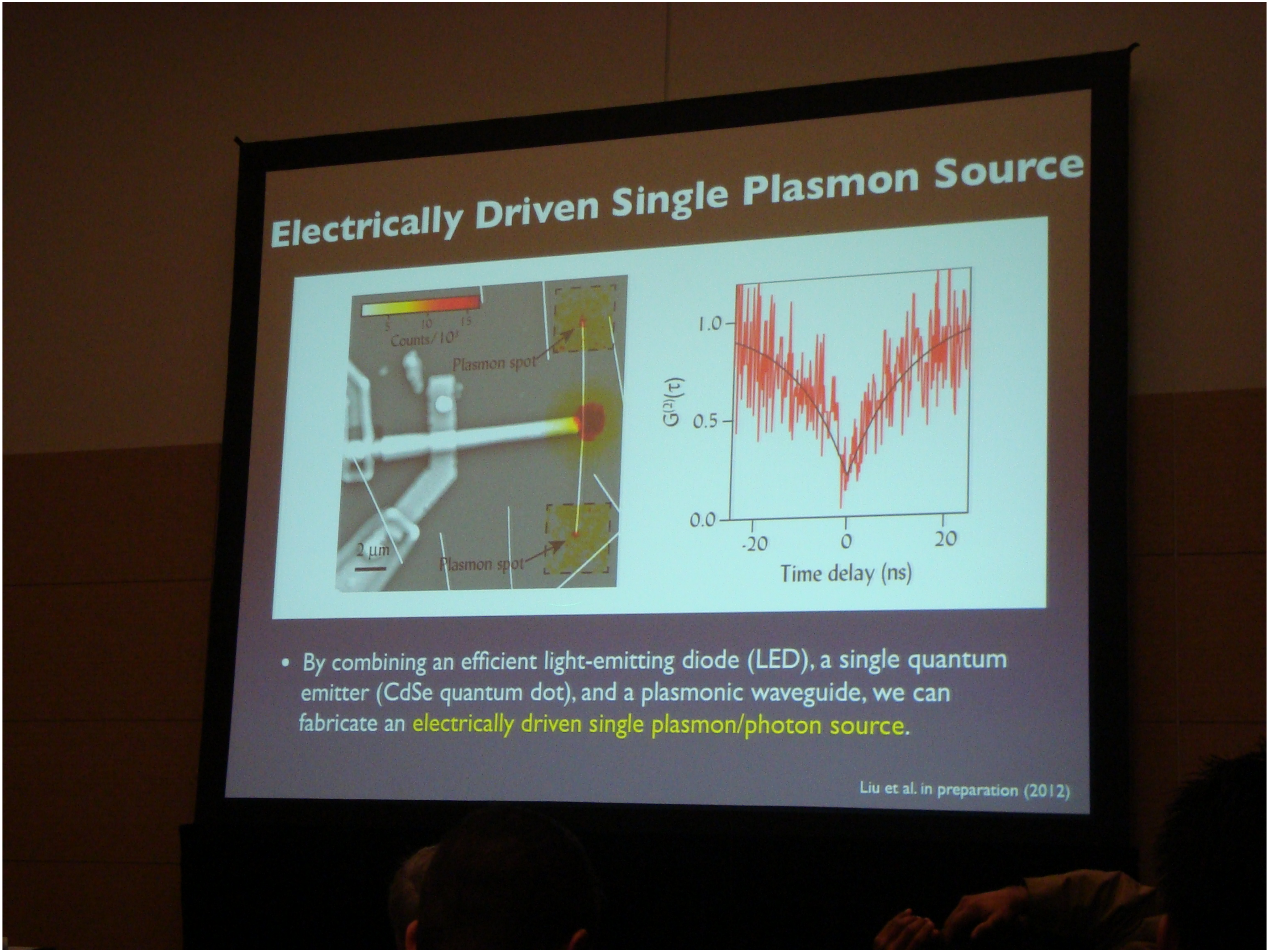
Liu et al. in preparation (2012)

GaN NW Heterostructure



- *n*-GaN/$In_xGa_{1-x}N$/*p*-GaN nanowire heterostructure can be used to generate color-tunable light emitting diodes.

Qian et al. *Nano Lett.* **5**, 2287 (2005)


Electrically Driven Single Plasmon Source
5 10 15
Counts/10³
Plasmon spot
Plasmon spot
2 μm
G⁽²⁾(τ)
1.0
0.5
0.0
-20
0
20
Time delay (ns)
• By combining an efficient light-emitting diode (LED), a single quantum emitter (CdSe quantum dot), and a plasmonic waveguide, we can fabricate an electrically driven single plasmon/photon source.
Liu et al. in preparation (2012)