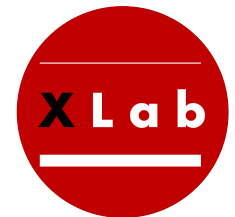
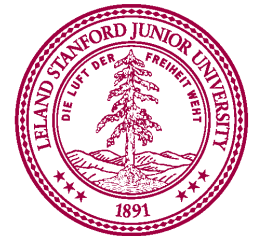


Gallium Nitride High Electron Mobility Pressure Sensors for Venus Exploration

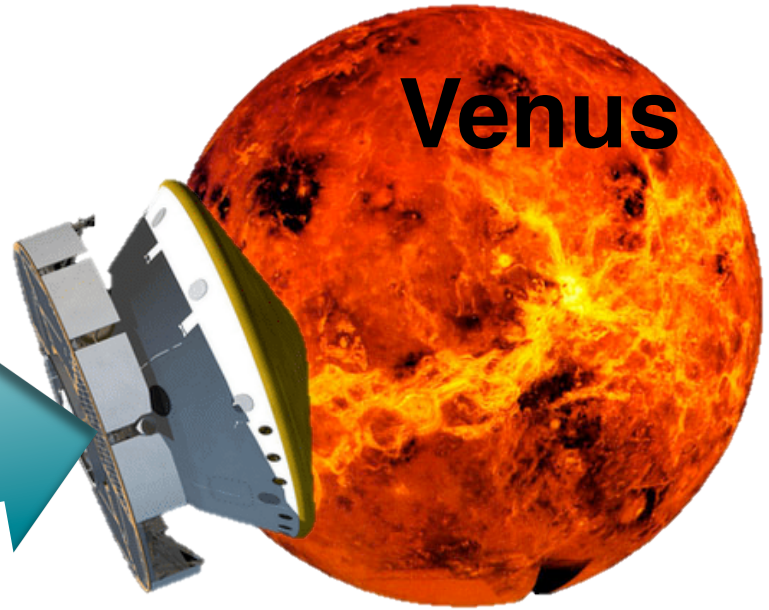
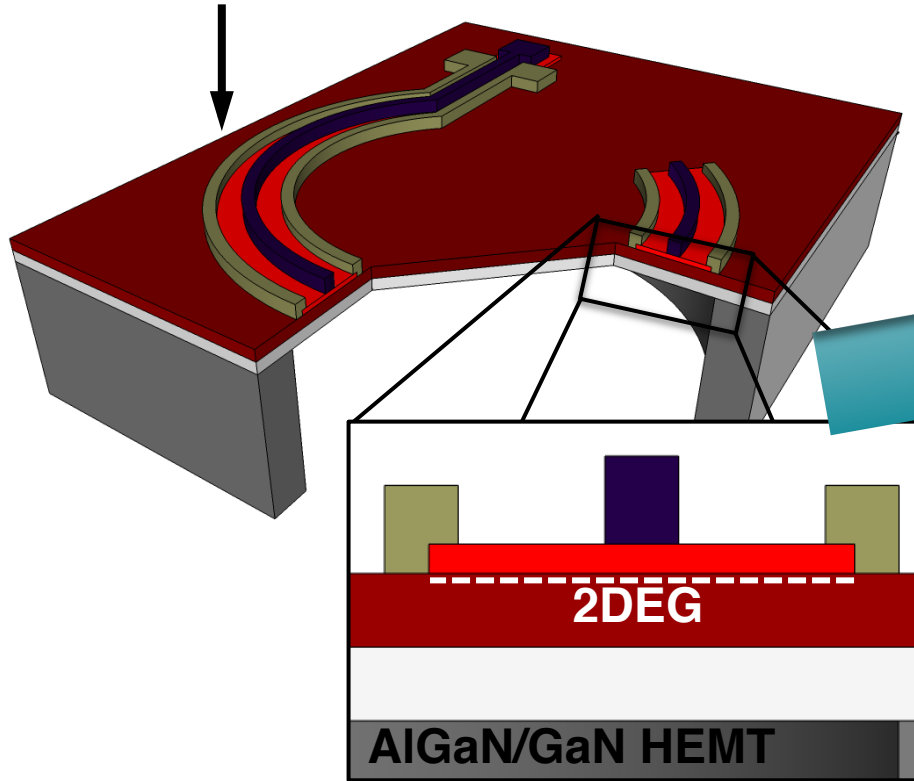
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Overall Research Motivation and Goals

AlGaN/GaN Pressure Sense Element



- | | | |
|---|---|--|
|  AlGaN |  AlN |  Schottky contact |
|  GaN |  Ohmic contact |  Silicon |

Advantages of Gallium Nitride

	Si	SiC	GaN
Bandgap (eV)	1.1	2.4-3.2	3.4
Gauge factor ($\% \Delta / \epsilon$)	90	31.4	26
Max Operating Temp ($^{\circ}\text{C}$)	150	600	600

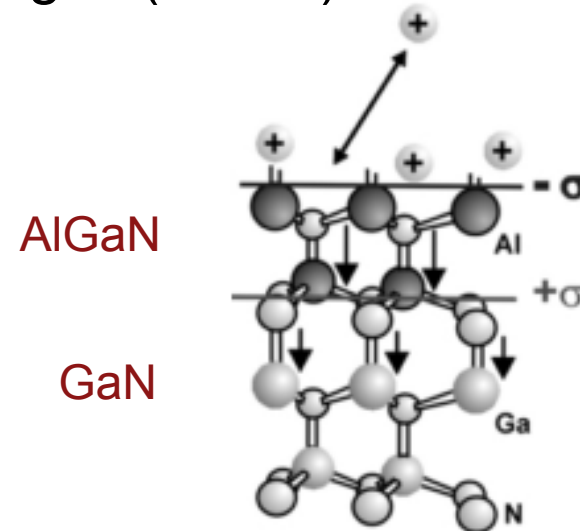
¹V. Cimalla et al., Journal of Physics D: Applied Physics, vol. 40, no. 20, 2007.

²M. Eickhoff et al., Journal of Applied Physics 90, 3383 (2001).

³G. H. Kroetz et al., Sensors and Actuators A: Physical, vol. 74, 1999.

- GaN is *piezoresistive*, *piezoelectric* and *pyroelectric*.

↳ A quantum well forms at the interface of GaN heterostructures known as a 2-dimensional electron gas (2DEG).



M. Stutzmann et al., Diamond and Related Materials, vol. 11, 2002.