



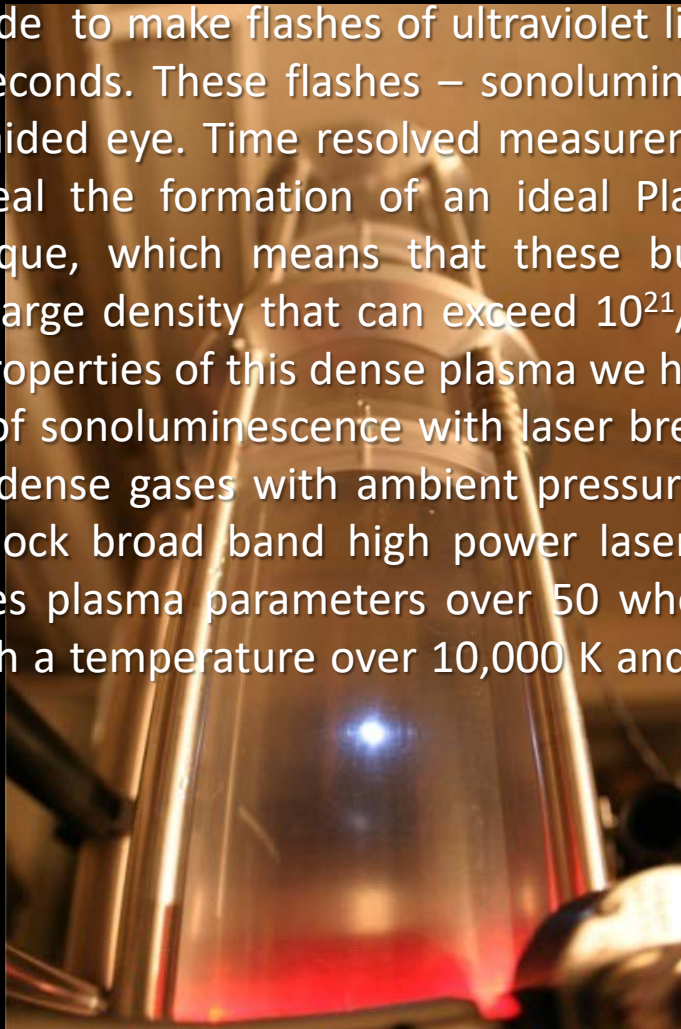
# Innsbruck Physics Colloquium

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## **The Dense Plasma That Forms Inside a Sonoluminescing Bubble**

The passage of a sound wave through a fluid with a bubble leads to pulsations are so nonlinear that acoustic energy is concentrated by 12 orders of magnitude to make flashes of ultraviolet light that can be as short as 35 picoseconds. These flashes – sonoluminescence - can be seen with the unaided eye. Time resolved measurements of the spectrum spectra reveal the formation of an ideal Planck blackbody. A blackbody is opaque, which means that these bubbles are microplasmas with a charge density that can exceed  $10^{21}/\text{cm}^3$ . To study the thermodynamic properties of this dense plasma we have duplicated the parameter space of sonoluminescence with laser breakdown and electric discharges in dense gases with ambient pressures up to 100 atm. The sparks can block broad band high power laser pulses and laser breakdown reaches plasma parameters over 50 where a plasma condensate forms with a temperature over 10,000 K and a tensile strength similar to a solid.



**Tuesday, 2.5.2017, at 17:15 h in lecture hall C**