

## ***Acoustics Laboratory***

Updated 9/06

**Location:** Department of Physics

**Established:** 1998

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**Purpose:** Laboratory for computer-aided string (violin, viola, cello, guitar...) musical instrument development with research in the areas of:

- normal mode vibrational and acoustic radiation analysis (1999-),
- violin normal mode data-base (2000-),
- simulation of normal mode and bowed acoustic output (2001-)
- supporting computer-based modifications or redesigns of violins, or designing new string instruments from “scratch”

### **Capabilities:**

Automated, non-mass loading modal and radiation analysis of violin in anechoic chamber.

Geometry and density characterization of the woods used in violin construction.

Construction of computer model unique to each violin.

Computation of vibration, radiation and response characteristics of each violin

### **Instrumentation:**

(includes all necessary computers)

Anechoic Chamber with violin holding/positioning fixture;

rotating, semicircular 13-microphone array capable of covering sphere in violin far-field radiation zone;

16-channel computer-based acoustic and modal analysis system;

scanning laser Doppler vibrometer;

modal and acoustic analysis software;

finite element software;

CT scan -> finite element model software