

MNTC Video	
Video	Audio
<p>Generic shots of MNTC</p>	<p>We want to welcome you to the numerous capabilities available at the University of Louisville's Micro/Nano Technology Center or MNTC. A center equipped to perform micro and nano fabrication. Students or individuals outside the university are welcome to use the MNTC or the staff can perform services for you.</p> <p>-Music under narration</p>
<p>Design, Layout and Modeling <i>Picture of the computer suite & software</i> <u>Graphic Listing Available Software</u> CoventorWare® Solid Edge Tanner EDA Silvaco TCAD</p>	<p>Before going into the cleanroom it is best to plan, model and evaluate your device in the virtual world to save time and money. The MNTC has a full suite of available software packages.</p>
<p>Photolithography <i>(Picture of a photomask and a photolithography patterned wafer)</i> <u>Graphic on screen listing Photolithography Capabilities</u> SEM & Electron Beam Lithography Photomasks and Direct Write with 128 bit Greyscale Contact Mask Photolithography Photoresist Polarity Reversal</p>	<p>The first area to visit is Photolithography or the process of transferring a pattern onto a substrate like a silicon or glass wafer. Before the advent of digital cameras negatives were used to make pictures onto light sensitive paper. In the cleanroom, a photomask is the negative and patterns are transferred onto silicon or glass wafers. First, a light sensitive material called photoresist is spun onto the wafer. The photomask is placed on top of the wafer and a special UV light is exposed through the photomask onto the wafer. The wafer is developed and the pattern appears on the wafer. The MNTC has the capability to create photomasks or to write directly onto wafers that have photoresist on them. This is called maskless photolithography. We can write to substrates in black or white, but also 128 shades of greyscale, too.</p>
<p>Thin Film Deposition <i>(Picture of a wafer that has had gold sputtered onto it)</i> <u>Graphic on screen Listing Deposition Materials</u></p>	<p>The next area on our tour is our thin film deposition bay, where we can deposit or grow films that can conduct or not conduct electricity. These include precious to non-precious metals, semi-conducting films,</p>

<p>Metals (precious to non-precious) Dielectrics Hydrophobic or Hydrophilic Coatings Metal Oxides</p>	<p>non-conducting films or films that repel or attract water. Most of these films are usually under 300 nm thick.</p>
<p>Etching, Machining and Bonding <i>(Picture of the wafer after gold etching)</i> <u>Graphic on screen Listing Etching, Machining and Bonding Capabilities</u> Metal, Dielectric & Silicon Wet Etching Metal, Dielectric & Silicon Dry/Plasma Etching Wafer Bonding</p>	<p>Our next stop in the cleanroom involves wet chemicals and dry gases that can etch a variety of materials including silicon, glass and metals.</p>
<p>Thermal Processes <i>(Picture of an oxidized wafer)</i> <u>Graphic on screen listing Thermal Capabilities</u> Oxidation Diffusion Annealing Rapid Thermal Processes Vacuum Ovens</p>	<p>Our final stop in the cleanroom are thermal processes needed to grow non-conducting layers, perform annealing or heat processes that bury materials further into the surface of wafer called diffusion.</p>
<p>Testing & Packaging <i>(Picture of a device that has been wire bonded in a DIP)</i> <u>Graphic on screen listing Testing Capabilities</u> Measure Film Stress & Film Thicknesses Height Measurements/Profiling Thermal Imaging <u>Graphic on screen listing Packaging Capabilities</u> Dicing Wire Bonding Flip Chip Packaging Printed Circuit Boards</p>	<p>During fabrication in the cleanroom we have many tools that can measure parameters such as thickness and stress that may be critical for device fabrication. We also have additional tools outside of the cleanroom that can take a wafer from the cleanroom and ready it for packaging.</p>
<p><i>Completed Devices & Testimonial</i> A quick description or title of a few devices made in the cleanroom with pictures.</p>	

Closing Statements & Contact Info

Graphic

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Check out the Micro/Nano Technology Center
at the University of Louisville and let us help
your research become a reality.