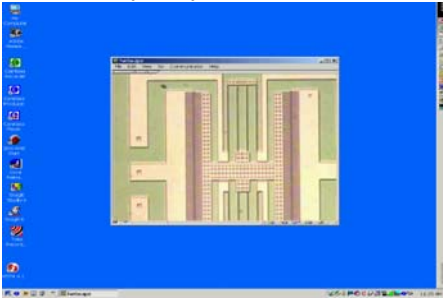


# Remote Users at SNF

## REMOTE USERS at SNF

Remote Users are those members who do not come to SNF and do their nanofabrication processing themselves, but rather have SNF staff do the processing for them. This may be due to limited scope of their projects, or limitations on travel. Generally only well-defined projects are done, and usually only for non-Stanford academic users. Last year SNF did work for about 30 remote users. One such user was a graduate student from the University of Michigan who had SNF help fabricate a MEMS structure with comb drive actuators, shown at left. Deep holes were etched in Si SOI wafers using the STS deep RIE etcher.



## MEMS-EXCHANGE

Another option for remote users is to make use of the MEMS-Exchange, administered by the Corporation for National Research Initiatives (CNRI). This is a network of fabrication facilities across the country, including SNF, that provide a vast range of on-demand MEMS process and design capabilities. The users are able to pick processing steps from the extensive on-line process library and decide at which fab site they are performed. SNF performed assisted in about 50 MEMS-Exchange user runs last year.

## INDEPENDENT CONTRACTORS

Remote users can also hire an independent contractor to perform their fabrication for them. SNF keeps a list of contractors who, although they are not employed by SNF, are typically experienced SNF labmembers.

## WEB-BASED REMOTE USER CAPABILITIES

SNF has developed a wide range of web-based tools which allow researchers located remotely to view and inspect their wafers being processed and to interact with onsite researchers or SNF staff. These tools include mobile webcams, microscope cams, SEM cams, web-based whiteboards, and automated downloads for still microscope image transfers. One of the remote capabilities web pages is shown at right. An example of this use is the U. of Michigan student mentioned earlier. The researcher was able to view and talk with the SNF staff while his wafers were being processed (see figure below). He then inspected his wafers on a microscope in real time after etching, while talking with the SNF staff member who was operating the microscope and viewing the same image. The web page which had the live microscope cam image is shown at the far left. The user was then able to decide on the next course of action for his processing.



The staff member and user were also able to discuss the processing sequence using the web whiteboard. The use of these web-based tools greatly improves the efficiency and productivity of remote users of SNF.