TelePresence Microscopy Building R&D Collaboration Technologies

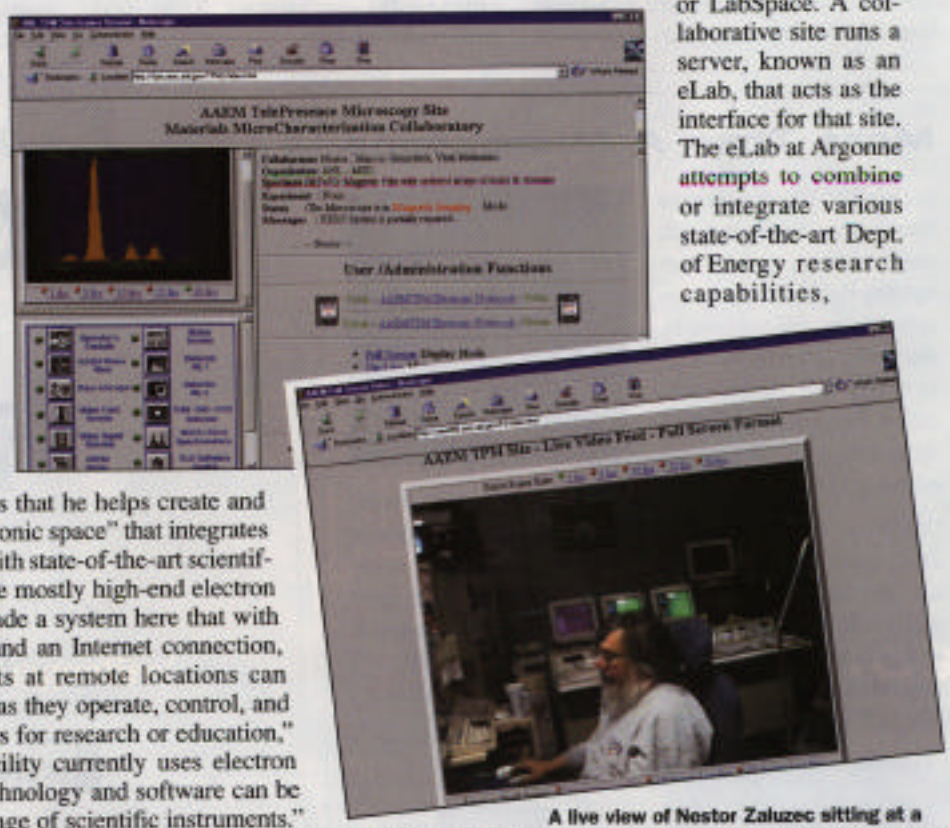
Researchers at Argonne National Lab are creating the Web-based interfaces that will eventually allow researchers to seamlessly monitor and control remote analytical instruments anywhere.

How would you like to work in a lab containing six different major microscopy systems, 17 computer monitors, 10 computer systems running on six different operating systems, and all the while being monitored yourself by seven video cameras that could be remotely controlled and viewed by pretty much anyone in the world who has Internet access capabilities. This is a glimpse of Nestor Zaluzec's world of TelePresence Microscopy (TPM) at Argonne (Ill.) National Laboratory (ANL) just outside Chicago. Log onto his Web site at http://tpm.amc.anl.gov any day between 9:30 a.m. and 4:30 p.m. Central Time and you're likely to see him in his blue jeans and tee-shirt underneath his Univ. of Illinois banners talking to someone about some aspect of his facility.

Zaluzec is a principal investigator at ANL's Advanced Analytical Electron Microscopy (AAEM) TPM Collaboratory. Quite a mouthful of acronyms that says that he helps create and manage an online "electronic space" that integrates computing technology with state-of-the-art scientific equipment, in this case mostly high-end electron microscopes. "We've made a system here that with a Web browser, a PC, and an Internet connection, researchers and students at remote locations can interact with each other as they operate, control, and use scientific instruments for research or education," he says. "The TPM facility currently uses electron microscopes, but the technology and software can be extended to a diverse range of scientific instruments." Indeed, Zaluzec's system is being considered for experimental setups on Argonne's Advanced Photon Source (APS) and it has been evaluated by Sematech for semiconductor fab applications.

The TPM technology was prototyped in 1994 and has been refined several times since then. It was first deployed outside of ANL in the fall of 1997. "Each year we get it to a new level, so that it's more like you're actually there, where the instruments are," he says. "We work at making the interaction seamless to the user with better communication systems that work for everybody. That includes better access to instruments and improved access to voice data. We try to make it fast, easy, simple, and inexpensive."

The TPM project at Argonne is part of a larger National Electronic Laboratory Infrastructure project, or LabSpace. A collaborative site runs a server, known as an eLab, that acts as the interface for that site. The eLab at Argonne attempts to combine or integrate various state-of-the-art Dept. of Energy research capabilities,



A live view of Nestor Zaluzec sitting at a console in his TelePresence Microscopy Collaboratory at Argonne National Laboratory can be seen on his Web site. Zaluzec created the Web-based software as an interface to high-end microscopes in his lab that allows remote users to run experiments and see the results on their own Web browsers, such as the spectroscopy information shown on in the top screen shot.