

**Exhibition Proposal for
Image and Meaning
2001: Live Demonstration
of irma
(Interactive Remote
Microscopy Application)**

Benjamin Grosser

(Submitted to The Image and Meaning
Conference, June 13-16, 2001)

Date Issued: March 2001

The Beckman Institute
Imaging Technology Group
Technical Report 01-006

Copyright © 2001 Board of Trustees of the University of Illinois

The Beckman Institute for Advanced Science and Technology
Imaging Technology Group
405 N Mathews
Urbana, IL 61801
techreports@itg.uiuc.edu
<http://www.itg.uiuc.edu>

Proposal for *Image and Meaning* Conference Exhibition

Benjamin Grosser

Imaging Technology Group
Beckman Institute for Advanced Science and Technology
University of Illinois at Urbana-Champaign

Introduction

I propose to present a live demonstration of our web-based microscope control software called *irma* (short for Interactive Remote Microscopy Application). The *irma* client communicates with server software connected to an Environmental Scanning Electron Microscope (ESEM) at the Beckman Institute. This application allows users to interactively control the microscope and collect data, all from a web-browser at a remote location. This software is actively used as the client interface in a project called *Bugscope*.

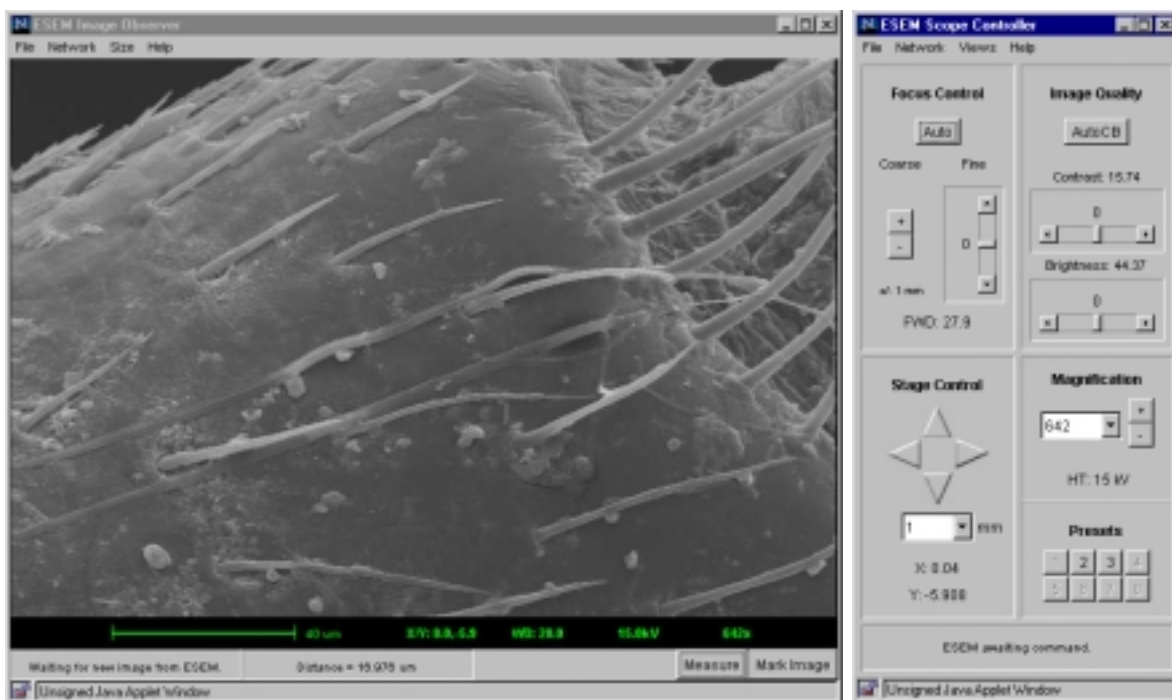


Figure 1: *irma* | ESEM interface. Image *Observer* (left) and Scope *Controller* (right).

About Bugscope

irma has been in use since early March, 1999 for a project called Bugscope (Potter et al., 1999). Bugscope (<http://bugscope.beckman.uiuc.edu>) is a K-12 education project that provides schools with the ability to interactively investigate bugs (usually small insects) in an ESEM over the Internet. School children at a particular location are given access to the control parameters provided by the *Controller*, while participants at other locations may also observe the session

with the *Observer*. Every image acquired during a school's session is automatically saved to a web-based database, allowing them to view and search the images online at a later time. Through the use of *irma*, school age children with varying backgrounds and equipment are able to use a unique resource.

About Irma

We have developed a web-based interface to an Environmental Scanning Electron Microscope (Philips XL-30 ESEM-FEG). This application allows users to interactively control the microscope and collect data, all from a web-browser at a remote location. The application, called *irma* (Interactive Remote Microscopy Application), offers several different modes of operation. These modes include the ability to support both single and multiple users. *Irma* also offers the usage concept of *sessions*, where multiple groups of people can use the microscope simultaneously, with each session being independent from another. *irma*'s client application is a true multi-platform application, and has been tested on Windows (NT/98/2000), MacOS, IRIX, AIX and Linux.

Acknowledgements

Support provided by the National Science Foundation (9871103), and the Beckman Foundation for the purchase of the ESEM. Computational hardware provided by the IBM Shared University Research Program. Support for the Bugscope Project provided by the Illinois Consolidated Telephone Company.

Exhibit Requirements

Minimum requirements: a live Internet connection without firewall restrictions to access non-standard ports (more information available if needed).

Preferred Requirements: a recent Windows-based computer with the following:

- a live internet connection (see minimum requirements)
- Internet Explorer 5.0+ installed.
- Large monitor capable of displaying at least 1024x768 resolution at 24 or 32-bit color.

References

Grosser, B. and Kisseberth, N. (1999) *irma*: An Interactive Remote Microscopy Application for WWW-Based Control of an Environmental Scanning Electron Microscope (ESEM). *Workshop on Automated Control of Distributed Instrumentation (ACDI '99)*.

Kisseberth, N., Brauer, G., Grosser, B., Potter, C.S., Carragher, B. (1999) JavaScope: A Web-Based TEM Control Interface. *JSB* 125, 229-234.

Kisseberth, N., Whittaker, M., Weber, D., Potter, C.S. and Carragher, B. (1997) *emScope*: A Tool Kit for Control and Automation of a Remote Electron Microscope. *JSB* 120, 209-319.

Potter, C.S., Carragher, B., Ceperely, M., Conway, C., Grosser, B., Hoyer, C., Kisseberth, N., Robinson, S., Sapp, J., Sinn-Hanlon, J., Soskin, P., Stone, D., Thakkar, U., Weber, D. (1999) Bugscope: Sustainable Internet Access to an ESEM for the K-12 Classroom. Abstract submitted to *Microscopy and Microanalysis 1999*.