

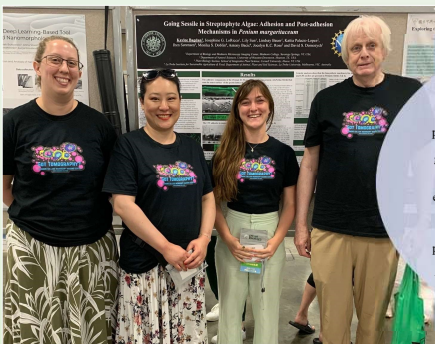
## Skidmore Mcgraw Microscopy Imaging Center

[www.skidmore.edu/smic](http://www.skidmore.edu/smic)

### NEWSLETTER (2024 Fall)

Skidmore Mcgraw Microscopy Imaging Center (SMMIC) is an institution-wide technology center opens to all Skidmore community. SMMIC has provided numerous microscopic courses and training, facilitated various microscopy related research projects to Skidmore faculties and students. The center is also a focal point for collaborative international research projects and for outreach activities to the local community. SMMIC also facilitates two microscopy classes opening to students in all science majors. For more information, please contact Lily Kozel ([lkozel@skidmore.edu](mailto:lkozel@skidmore.edu)).

### SMMIC images in plant biology international conference 2024



SMMIC images were presented in plant biology international conference hosted by America Society of Plant Biologists at the Hawaii Convention Center in Honolulu from June 22 to June 24. Thousands of plant scientists, professionals and students from more than 400 academic institutions, industry and government organizations around the globe attended this meeting. In our poster section, SMMIC images and models on electron tomography caught most eyes. Many researchers and students were amazed by our 3D electron tomography model built on the Golgi Apparatus structure of streptophyte algae. Some conference members took pictures of our poster and made note of SMMIC website. From left to right in picture: Josephine Loricco (Research Scientist in Biology), Lily Kozel (SMMIC), Kaylee Bagdan '24, David Domoczyk (Professor in Biology)

### SMMIC in interdisciplinary research

Skidmore student Leo Parra '24 conducted an interdisciplinary research between chemistry, microscopy and anthropology with Professor Heather Hurst during his senior year. He was investigating two mysteries archaeological samples from Guatemala. One is a paint pigment from a newly discovered mural site in Guatemala. The other is an unknown organic material from a tomb site of Xultun, which might be a burial burnt offering. To resolve the questions on both precious samples, Parra used the Scanning electron microscope (SEM) in SMMIC, a powerful and high-resolution tool to observe the surface topography and the chemical composition in any anthropology sample. Parra's results helped to gain insight of culture and lives of people who painted the art and to get one step closer to understand the secrecy organic materials in the ancient tomb site.

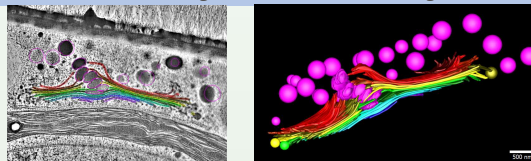


This picture is from Skidmore news article by Francie Wharton '25 and James Hellicke

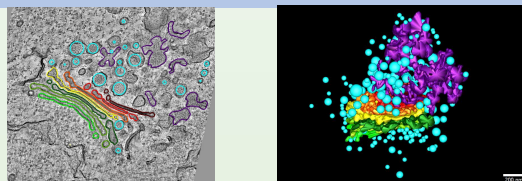
### Research highlight in SMMIC ----- Electron Tomography

Electron tomography is one of the most advanced technologies in cell biology to effectively define the 3-dimensional architecture of cellular structures with complex morphologies. The fundamental idea is that when there is sufficient data, the 3-dimensional image of the object can be reconstructed from Fourier transforms of 2-dimensional projected images obtained over a wide range of viewing directions. The first 3-dimensional models of the Golgi apparatus of the streptophyte: *Penium margaritaceum*, *Chara* and *Mesostigma* were derived from thousands of images on serial section samples over a broad angle range taken by Transmission Electron Microscope (TEM) in SMMIC. The 3D electron tomography models provide novel insights into the structure of Golgi stacks, surrounding vesicles and Trans Golgi Network and helps to elucidate a complex endomembrane system responsible for the processing of the extracellular matrix. These results were presented in plant biology international conference in June this year.

#### *Penium Margaritaceum* – "Fused" Golgi



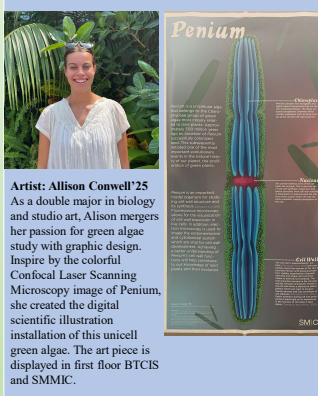
#### *Chara*



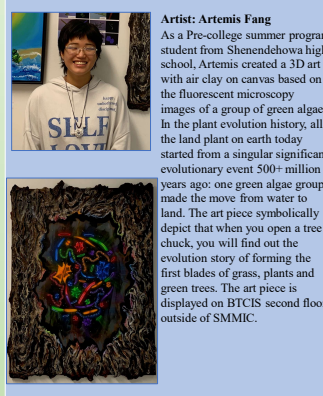
#### *Mesostigma*



### Microscopy and Art project in SMMIC



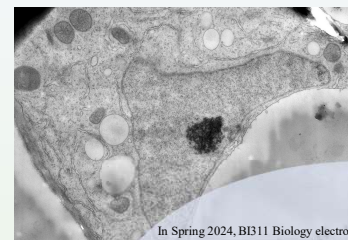
**Artist: Allison Conwell '25**  
As a double major in biology and studio art, Allison merges her passion for green algae study with graphic design. Inspired by the colorful Confocal Laser Scanning Microscopy image of Penium, she created the digital scientific illustration installation of this unicell green algae. The art piece is displayed in first floor BTCIS and SMMIC.



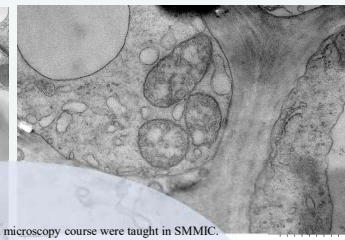
**Artist: Artemis Fang**  
As a Pre-college summer program student from Shennendehowa high school, Artemis created a 3D art with air clay on canvas based on the fluorescent microscopy images of a group of green algae. In the plant evolution history, all the land plant on earth today started from a singular significant evolutionary event 500+ million years ago: one green algae group made the move from water to land. The art piece symbolically depict that when you open a tree chuck, you will find out the evolution story of forming the first blades of grass, plants and green trees. The art piece is displayed on BTCIS second floor outside of SMMIC.

### Electron microscopy class in SMMIC

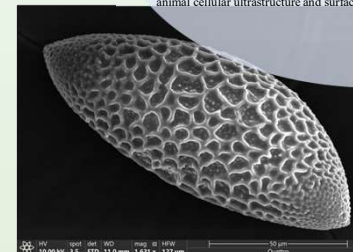
Arabidopsis cell TEM image by Celeste Farrell '24



Radish root cell TEM image by Scarlet Naples '24



In Spring 2024, BI311 Biology electron microscopy course were taught in SMMIC. Through this course SMMIC provides undergraduate students with a very precious opportunity to have a hands-on experience on two major kinds of Electron Microscopy in any scientific fields, Transmission electron Microscope (TEM) and Scanning Electron Microscope (SEM). It is one of the two popular microscopy courses offered to all Skidmore students especially in Biology and Chemistry major. Comments from some students included: "the fact it was all hands on, truly allowed me to learn. Also, this is stuff professionals do, and we get to do it as students"; "This lab requires you to come in independently create your portfolio which is challenging but rewarding". At the end of the term, each students produced a digital portfolio of TEM and SEM images from the samples prepared and sectioned by themselves. Please enjoy some beautiful plant and animal cellular ultrastructure and surface microstructure images captured by our students!



Tiger lily Pollen SEM image by Drew Delmore '24



Spider eye SEM image by Anne Coant '25

### Skidmore Young Scholars Cell Biology Institutes in SMMIC

Aa summer science program supported by the National Science Foundation grant for local high school students was hosted in SMMIC the fifth time this July. This program centers in cell biology and biology microscopy with incorporation of a variety of STEM related subjects from genomics to computer science. The goal is to provide opportunities for high school students to explore the subdisciplines of science and learn about potential careers in these areas. Most often feedback from the students are "really enjoyed", "wish to have more time to take images on the microscopes", and "this was SO cool", etc. For more photos and information, please go to <https://www.skidmore.edu/penium/outreach>.

