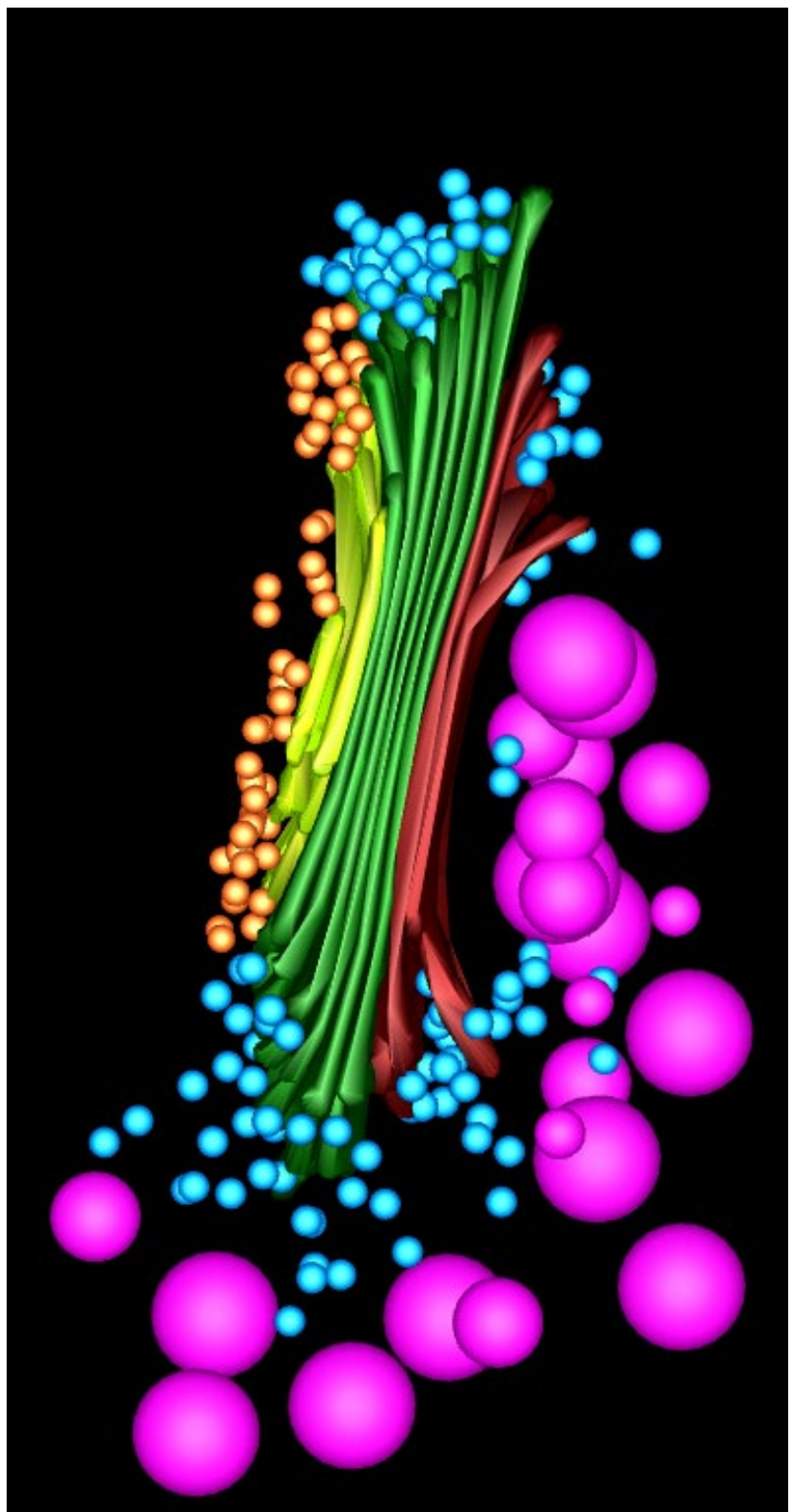


NEWSLETTER  
(2023 Fall)

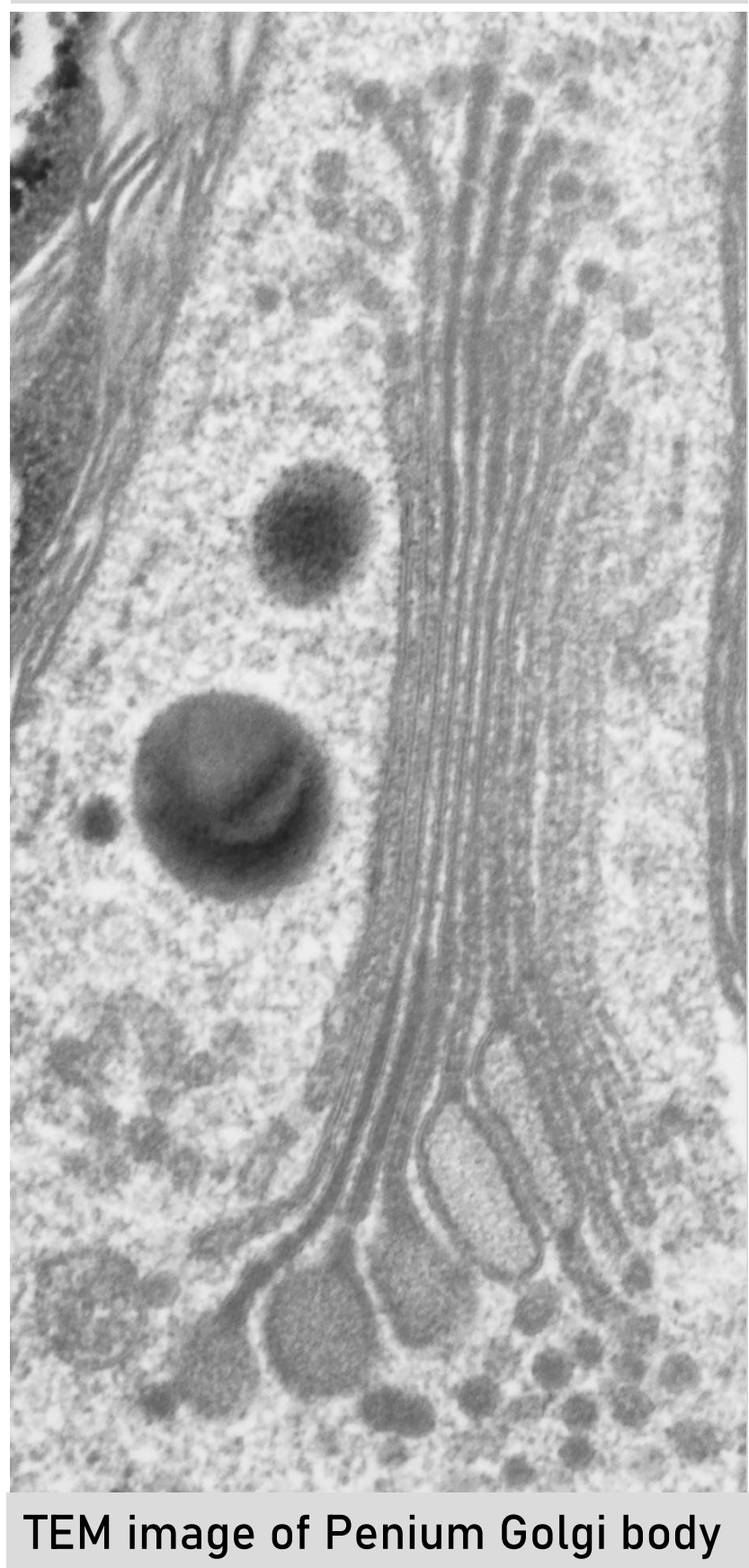
Research highlight

Land plant invasion and the green algae that led the charge!

500+ million years ago, the surface of land on Earth was a barren and hostile place. Life was flourishing in the oceans and in fresh water ecosystems, some green algae lived at the precarious interface between water and land. On one occasion 500+ million years ago, a green alga related to the modern day Zygnematophyceae (i.e. the assemblage of green algae most closely related to land plants) successfully moved from freshwater water to land. This event subsequently initiated the origin and evolution of our richly diverse terrestrial flora and one that profoundly changed the natural history of the planet forever. This invasion of land required a molecular tool box that could overcome major environmental pressures present on the planet at that time. In an effort to learn about this evolution process, the National Science Foundation-funded research (NSF- MCB grant 2129443) of Professor David Domozych examines the subcellular biology of the model unicellular green alga, *Penium margaritaceum*. Along with Josie LoRicco, post-doctoral associate, Lily Kozel, SMIC Coordinator, and several undergraduates, this research team employs a variety of microscopy-based technologies including light, confocal laser and electron microscopy to study the secretory mechanisms of *Penium* that lead to the production of the cell wall and extracellular polysaccharides. These complex structures are necessary for *Penium's* survival especially in water-stressed habitats. This research also provides insight into mechanisms that were critical for the evolution of land plants. For further information please consult [doi.org/10.1093/plphys/kiac390](https://doi.org/10.1093/plphys/kiac390) and [doi.org/10.1093/aob/mcad054](https://doi.org/10.1093/aob/mcad054).



Electron tomography model of Penium Golgi body



TEM image of Penium Golgi body

WELCOME

Skidmore Microscopy Imaging Center (SMIC) was established by Professor David Domozych in 2002, opens to all Skidmore community. In the last 20 years, SMIC has provided numerous microscopic courses and trainings, facilitated various microscopy related research projects to Skidmore faculties and students, and hosting many outreach high school summer programs in surrounding community.

In 2020 summer, all five SMIC labs were physically united in brand new BTCIS building with a central teaching area. The new space is efficiency, modern, and with all the safety control features. With the support of NSF and the College, microscopy center was updated with a new FEI field emission scanning electron microscope installed in 2019 and a new Hitachi transmission electron microscope installed in 2020. This fall an ongoing NSF funding application is prepared to bring a new generation of confocal laser scanning microscope to SMIC.

As a modern state-of-art microscopy center, SMIC has been a valuable resource in Skidmore scientific majors and plays an important role in building top notch natural science program at Skidmore College.

For SMIC tour, please contact David Domozych ([ddomoz@skidmore.edu](mailto:ddomoz@skidmore.edu)) or Lily Kozel ([lkoz@skidmore.edu](mailto:lkoz@skidmore.edu))

Microscopy  
in Art



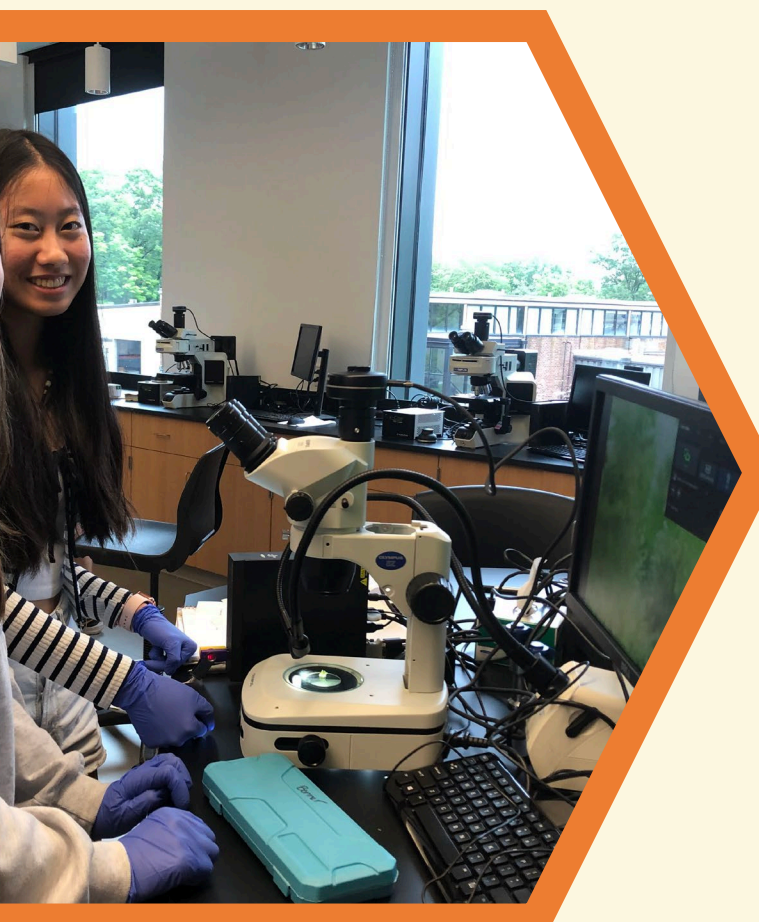
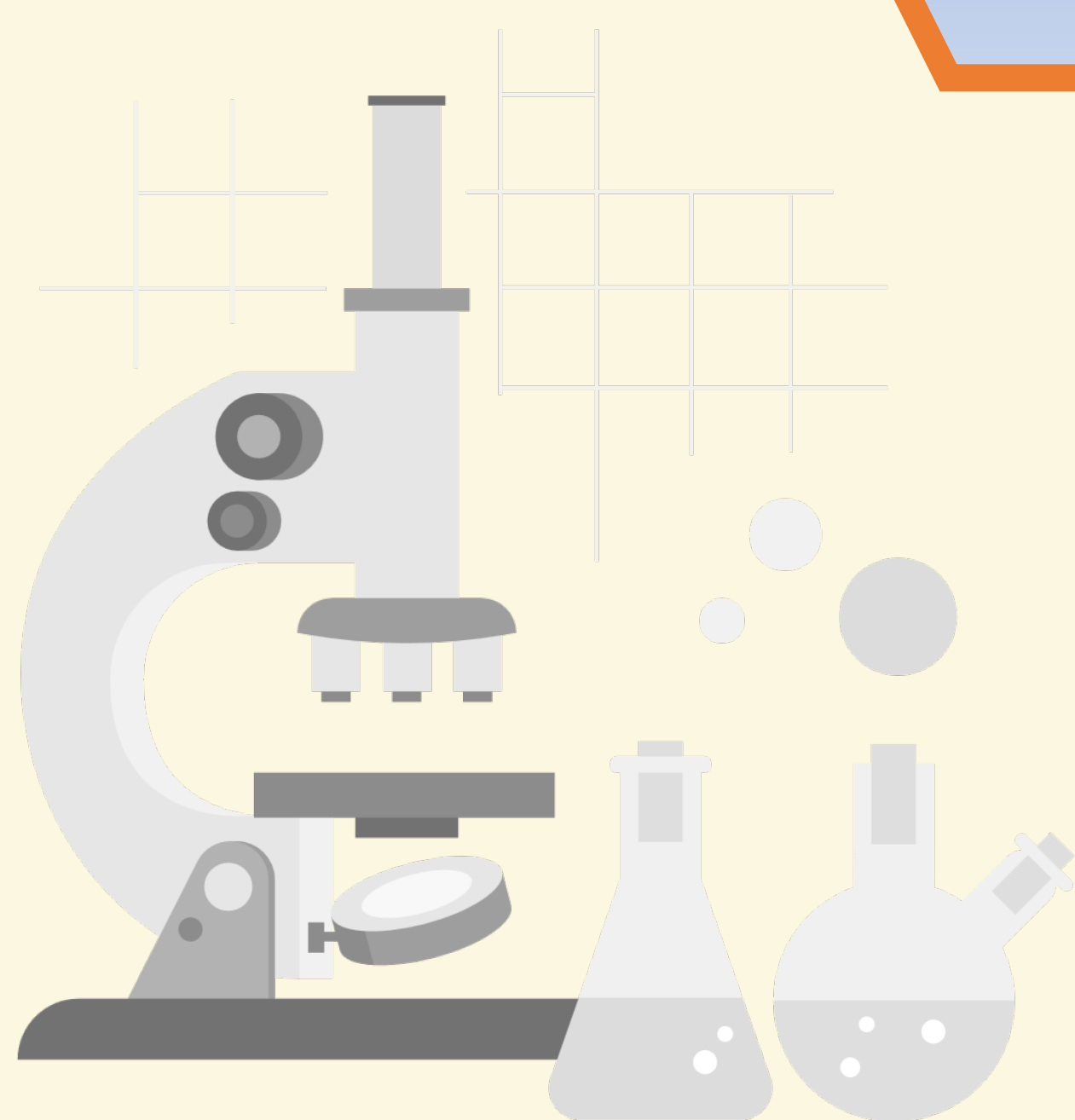
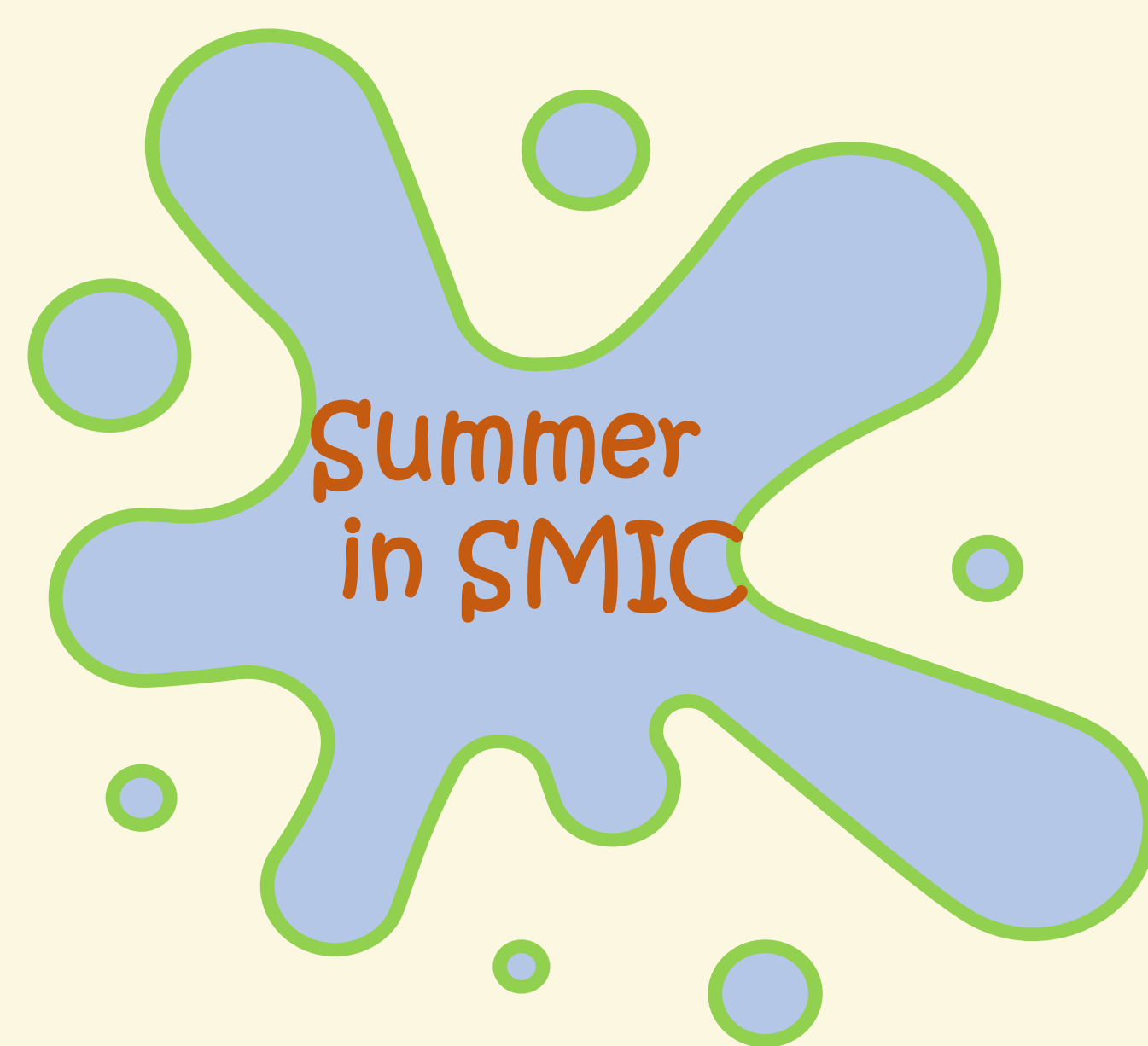
Microscopy, as a specialized field of science, reveals nature in microworld, a great world to inspire art. The combination of art and microscopy unfolds the beauty in science and awakens the power of art. This summer in SMIC, Shenendehowa high school student, Jenny Fang (a.k.a. Artemis @art.emis\_the\_artist on Instagram), created an art piece joining art with green algae light microscopy images under the advise of Pro. Domozych. The art work symbolically depicts wet land green algae as ancestors to all known land plants. Originating from the water, such organisms crawled up to land, created the Earth we see today. The art piece is presented in BTCIS 2<sup>nd</sup> floor hallway.



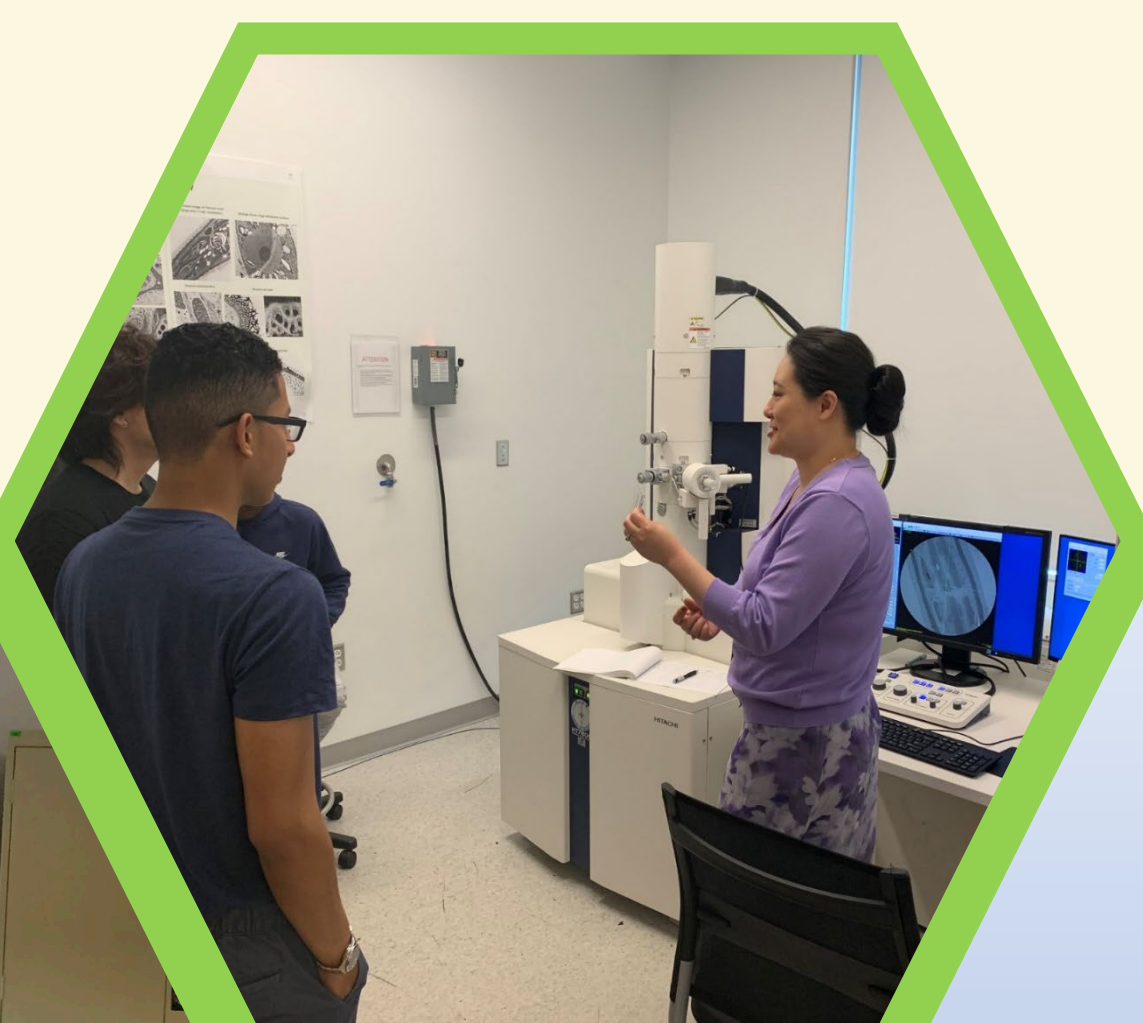




Skidmore Young Scholars Cell Biology Institute, a summer science program for local high school students was hosted in SMIC and department of Biology this July. This program is supported by the National Science Foundation grant award to Professor David Domozych. It centers in cell biology and biology microscopy with incorporation of a variety of STEM related subjects from genomics to computer science. The goal of this program is to provide opportunities for high school students to explore the subdisciplines of science and learn about potential careers in these areas. A current senior Skidmore student in Biology, who has attended the first year of this program in 2016, said "This program sparked my interest in STEM, and led to me pursuing my career in the field." for more photos and information , please go to <https://www.skidmore.edu/penium/outreach>.



During summer SMIC facilitated on going microscope related researches in biology, neuroscience, chemistry, geoscience etc.. One of the Skidmore student researchers on the single cell green alga *Penium margaritaceum* research project, Kaylee Bagdan, describes: "Skidmore Microscopy Imaging Center has been a place of comfort, learning, and endless opportunities for me to growth my skill set and research capability on all types of microscopes, which gives me the confidence and foundation to pursue my research career in biology science". Publications related to SMIC contribution in research is at <https://www.skidmore.edu/smic/publications.php>.



The Microscopy module of Skidmore Scholars in Science & Mathematics (S3M) program was held in SMIC in the week of June 14. This is the third year in a roll we hosting this session in SMIC. Besides learning about modern microscopy and its current real world research applications in life sciences, Students were provided hands-on experience with the major types of microscopes including light microscopy, fluorescence microscopy, immunolabeling and fluorescent protein technology, confocal laser scanning microscopy and electron microscopy.

