USG Asia Council

Spring 2018 Faculty Development Workshop Proposal

Science, Technology, and the Environment in Asia

Eric Kendrick, GSU Perimeter College

1. **Theme:**

   Science, Technology, and the Environment in Asia

   Alternate Titles:
   - Perspectives on Science, Technology and the Environment in Asia
   - Science, Technology and the Environment in Asia: Historical and Contemporary

2. **Rationale:**

   We have completed an outstanding cycle focusing on the major countries and regions – China, India, Southeast Asia, South Korea and Japan – and have discussed moving to a theme-based approach for upcoming workshops. Everyone seemed to concur that this was a good move.

   While there are many worthwhile themes to explore (Women and Gender; Religion and Spirituality), a science focus is an ideal way to kick off this new cycle for its capacity to address relevant global issues and pull in faculty from areas beyond the humanities and social sciences.

3. **Plenary Speaker:**

   Matt Marone, Associate Professor of Physics, Mercer University

   In addition to outstanding accomplishments in Physics and Astronomy, Matt's diverse portfolio includes forays into the humanities, particularly related to China. He has presented and lectured widely on *Ancient Chinese Science and Technology* and related subjects. This topic would have great appeal for those from science and non-science fields. In additional to regular participation in ASDP, with a similar focus as our Asia Council workshops for curriculum infusion and equipping faculty, Matt attended our 2017 workshop and is familiar with how to reach our target audience. As he resides in Macon, he is tentatively planning to attend our Fall 2017 meeting. See more info on Matt below.

4. **Location:**

   GSU Perimeter College – Dunwoody Campus (same venue as 2017)

   #1. The Dunwoody Campus has a small observatory (see below) that Matt and Perimeter staff could use for demonstrations (connecting with his plenary theme) as a special event after the Friday evening meal, like the Taiko Drum performance was our special event in 2017.

   #2. The cultural displays at the 2017 workshop added a new dimension to the workshop. I could leverage three close partners, the Japanese Consulate, the Japan America Society, and TECO (Taipei Economic & Cultural Office), who regularly engage with us at the Dunwoody Campus, to organize displays related to science and technology. (We can also reach out to Korean and Indian groups for similar displays, as well as Japanese firms that regularly organize science and technology displays at JapanFest.)

5. **Date:**

April 6-7 2018 ▪ Fri & Sat (last year's workshop: April 7-8)

Other dates to consider:

- March 22-25 AAS ▪ Association of Asian Studies national conference (2 weeks prior)
- March 1-3 ADDP ▪ Asian Studies Development Program national conference (5 weeks prior)

6. **Finances**

I recommended for the 2017 workshop that we consider a nominal fee ($5 or $10) to cover food, but ultimately we decided to keep it free. Given the proposed transition from a regional to a theme-based approach, and that this proposed science focus would take us beyond our typical target audience, I propose that the workshop remain free for 2018, with this issue revisited for 2019.

7. **ASDP Collaboration**

For 2017, we considered partnering with the Asian Studies Development Program to promote our workshop as an ASDP regional workshop, but the timing was too short. We are equipped to do this in 2018, especially with our strong connections to ASDP. The science focus should be particularly appealing to ASDP. This would also position us well for proposing to host the ASDP national conference in Georgia in 2019 if we decide to pursue this opportunity.

8. **Potential Session Topics:** (with discipline connections)

The topics below are by no means an exhaustive list. They are initial ideas to demonstrate the range of options for this theme that are relevant for core curriculum instruction and that connect with the interests of science and non-science faculty. With two Friday sessions (before the plenary) and two on Saturday, Asia Council members can easily secure four outstanding speakers from their networks of local, state and regional experts.

1. Environmental Issues and/or Disaster Response	Ecology, Geography, Political Science
2. Ethnical Issues in Science: East vs. West	Philosophy, Religion, Sociology
3. Math & Science Education in Asia	Education, Public Policy
4. Silicon Valleys of Asia	Business, Economics, Urban Planning
5. How Korea's Electronics Industry Overtook Japan	Business, Economics
6. Outsourcing in the Technology Sector	Business, Economics, Public Policy
7. Healthcare Advances and Challenges in Asia	Health Sciences, Sociology, Public Policy
8. Robots in Japan	Technology, Gerontology, Popular Culture
9. Space Industry in Asia	Engineering, Public Policy
10. Nuclear Issues on the Korean Peninsula	Political Science

Matt Marone

Associate Professor of Physics, Mercer University
Ph.D. Clemson University

2015 ASDP National Conference

Ancient Chinese Science and Technology - A Vehicle for Teaching Introductory Physics

A new general Physics course incorporating Ancient Chinese Science has been developed at Mercer University. Initially aimed at Asian Studies minors, this course fulfills the general science requirements for a wide range of majors. We present a broad scope of Chinese inventions and technological innovations in their historical and cultural context. In some cases, the technologies are recreated and examined using modern laboratory techniques. Once the technology or phenomena is understood in its original setting; we then apply the principles of modern day Physics and develop a more scientific analysis. The magnetic compass, for example, can be used as a navigational instrument, a "Chi meter", or as a magnetometer. This device naturally leads to topics such as Geomancy and Feng Shui. Students build a simple compass in lab and then use it as a measuring instrument for exploring the magnetic field produced by wires and the Earth. Once students understand the compass in a Chinese context we crossover to the work of western scientists such as Gilbert, Ampère and Faraday. Other experiments include levers, paper making, sericulture, astronomy, acoustics and bronze casting. In all my classes I make an effort to present the phenomena first and then move to the theoretical development. This "phenomena first" model is more natural considering how scientific discoveries are usually made. Tying physical principles to historical and cultural context first, has a way of appealing to typical liberal arts majors who walk into science classes with a wide range of fears and negative preconceptions.

2017 ASDP National Conference

Science revealed in Brush Talks from Dream Brook (梦溪笔谈), Connecting Ancient Science to the Modern World

Shěn Kuò's memoir Brush Talks from Dream Brook covers a wide range of topics including some early scientific observations. Parts of the book read like the recollections of a retired official. Other entries treat topics such as astronomy, cartography, pharmacology, chemistry and minerology. It seems like he knew something about everything and that exactly right, he did. Perhaps the most famous entry is his discussion of the magnetic compass and the observation that the needle did not point true south. Joseph Needham credits this observation about the needle as the genesis of his own career as a sinologist. I will discuss how the science revealed in *Brush Talks* influences the curriculum of my own class on ancient Chinese science. We will examine several of Shen Kuo's observations and show how they connect to our modern understanding of the physical world.

2015 Asian Studies Symposium, Belmont University ▪ www.youtube.com/watch?v=mPQ8BvAXI6U

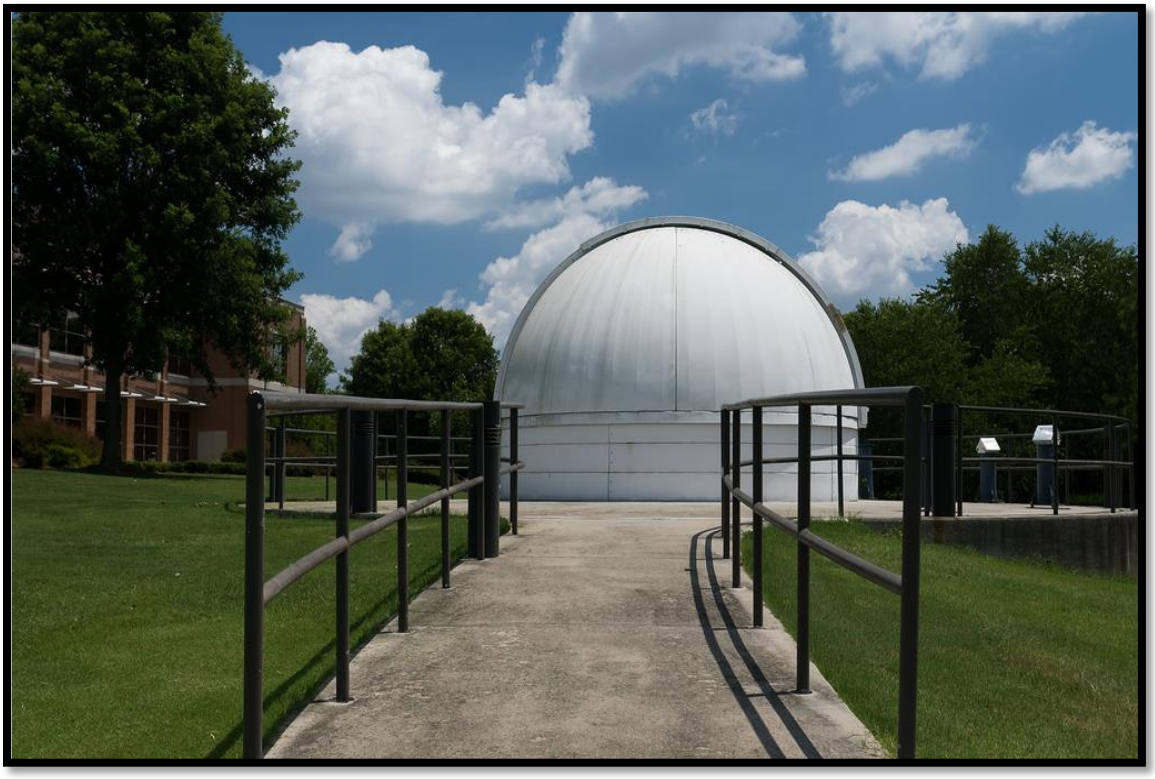
Background

My background is in experimental physics. As a graduate student at Clemson University, I worked in the area of superconductivity. This work formed the basis of my PhD dissertation entitled *Growth, Characterization, and Elastic Properties of Bismuth Based High Temperature Superconducting Whiskers*. As a Faculty member at Mercer, I have the freedom to combine my interest in physics with other areas of the natural sciences and humanities. For example, I teach in the Great Books program. Some of the other classes I teach include Astronomy and the Acoustical Foundations of Music. I am the faculty advisor for the Mercer Astronomy Club.

My current research interests are in the areas of Space Resources and the History of Science - the very old and the very latest technologies. In space resources we try to understand how humans can use resources beyond the Earth to enable space exploration and colonization. I am particularly interested in the area of *In Situ* Resource Utilization (ISRU) for space exploration. The best way to describe ISRU is as living off the land, but the land happens to be the Moon or Mars. For the past few summers I have worked with the Space Resources group at NASA/ Marshall Space Flight Center. This work was shown on the NASA documentary Series ***Focus on Marshall.*** *The episode is* ***"October, 2007, Dusty Plasma Lab, In Situ Resource Utilization & Technology Development."*** My work with NASA this past summer was on a project for extracting volatiles from lunar soil. We have a proposal in and I am waiting to hear if we will get funded for developing a space station experiment Involving electrochemical deposition of metal from meteorites.

I have a book contract with Institute of Physics Press (IOP) for two volumes about Chinese science with lab experiments.

GSU Perimeter Dunwoody Observatory



Students interested in astronomy can take advantage of the Dunwoody Observatory, a working scientific facility for students. The dome and its telescope, each equipped with powerful motors, rotate as you look at different regions of the sky. The observatory offers telescope viewing by appointment, and the outdoor pad around the observatory dome is available for viewers any time. The observatory also schedules open houses and other events open to the public.