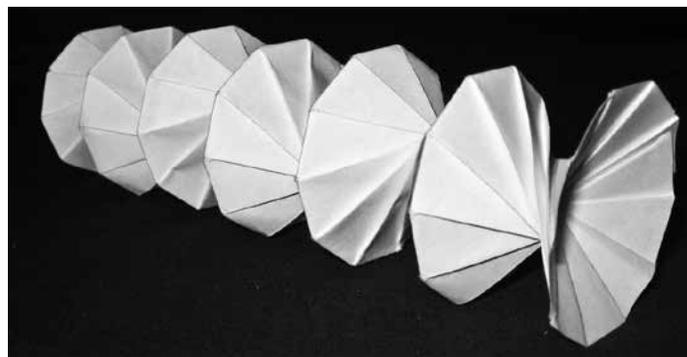




THE SHAPE OF OUR SPACE: The History of Geometry

Gregory Pevzner



ETHNOMATHEMATICS

Lawrence Shirley

Session II

Monday, 11 a.m. (begins Oct. 14)

Fee: \$65

In this course, we will explore the history of geometry. Only a basic understanding of math is needed to understand what this history is all about. We will concentrate on one topic in particular: the turbulent history of the foundation of geometry related to the fifth postulate of Euclid. The history is about people who influenced the creation of this mystery, those who failed and those who succeeded in resolving the mystery, and finally, those who created a new understanding of our world based on the solution of this mystery.

Greg Pevzner is a retired software engineer/manager. He was born and raised in St. Petersburg, Russia, where he received a graduate degree in physics from the Polytechnical University. After immigrating to the United States, he also received his M.S. in computer science from Brooklyn Polytechnic Institute (currently a part of New York University). Prior to his retirement he worked for over 30 years in AT&T Bell Laboratories in New Jersey, first as a software developer and later as a manager of an engineering team. Greg has always had a keen interest in mathematics and history. He is eager to share his knowledge and enthusiasm with Osher students.

Session I

Monday, 11 a.m. (begins Sept. 9)

Fee: \$65

Ethnomathematics is the human side of mathematics. It is briefly defined as “the mathematics of cultural groups”. It is something like any anthropology/sociology of mathematics, also bringing in history, philosophy, and even political science. We often think of mathematics as universal, but the mathematics we learned in school and most of research mathematics really developed from traditions in Europe and the Middle East. Actually, mathematical thinking is present in all societies, and mathematics interacts with culture in many ways. We will look at examples of mathematics in non-Western—numbers, geometry, patterns—and also some surprising examples of culture and applications mixed into Western, academic mathematics. This will include some activities, games, and nerdy jokes! As you come to this class, try to think about your own cultural heritage, your interests, your hobbies, and your family traditions. We can probably find mathematics in those activities—your own personal ethnomathematics. No advanced mathematics is required for this course. This is a repeat of the course offered in spring 2017.

Lawrence Shirley, Ph.D., is a mathematics educator with special interests in the history and culture of mathematics and ethnomathematics. He is originally from Arizona and has a B.S. in mathematics and history from Caltech, a M.Ed. in international education from Ahmadu Bello University (Nigeria). After Peace Corps service as a secondary mathematics teacher in Sierra Leone, he taught mathematics education at Ahmadu Bello University for fifteen years. He was a professor at Towson University from 1989 to 2015. He is a past-president of the North American Study Group on Ethnomathematics and organized the Fourth International Conference on Ethnomathematics in July 2010. He retired in 2016 as professor emeritus.



EARTH, AIR, FIRE, WATER

Josephine Johnson



CLIMATE CHANGE: Impact and Understanding

Jane Wolfson

Session II

Thursday, 1 p.m. (begins Oct. 17)

Fee: \$65

We live on a big, beautiful, complex, heated watery ball—a system that balances physical, chemical, and biological forces gently enough that life has been allowed to evolve and diversify. This course examines four of earth's spheres: lithosphere (land or earth), atmosphere (air), exosphere (sun and space), and hydrosphere (water). The interactions of these four spheres allowed for the possibility of the fifth and final sphere, the biosphere (life). Each lecture will focus on aspects of earth's characteristics and uniqueness as defined by the influence of the non-living spheres. Under "earth", plate tectonics, earthquakes, and mountain formation illustrate how land masses change. Under "air", the changing composition of gases in our atmosphere enhanced development of diverse life. Under "fire", the sun's life giving energy and the residual heat of the planet, geothermal energy, will be discussed. Under "water", the incredible qualities of water and water's role as the planet's core planetary substance will be explained. We participate, just by being alive, in a long history of extraordinary planetary developments.

Josephine (Jody) Johnson, Ph.D., is a pollinator scientist and an educator. She earned her Ph.D. in toxicology and an M.S. in chemistry from the University of Maryland. During the summers, she researches impacts of pesticides, nutrition, and parasites on honey bee health at the USDA and through her business. During the academic year, she teaches environmental science, science of sustainability, physical sciences, and pollinators to college level and older students.

Session II

Tuesday, 11 a.m. (begins Oct. 15)

Fee: \$65

Climate change is often in the news, but the news articles rarely explain what is happening, why it is happening and what it means for us. After a brief "what do we know and how do we know it?" we will discuss the impacts of climate change or as it is sometimes called 'global weirding.' The impacts of climate change on food production systems, human health, ocean acidification, sea level rise, global human migration patterns, will be explored. This course aims to provide a better understanding of the science of climate change and its broad impacts on various aspects of our daily lives. Suggested reading: *The Cartoon Introduction to Climate Change* by Grady Klein and Yoram Bauman, 2014 (Island Press). This is a repeat of the course offered in spring 2019.

Jane L. Wolfson received her Ph.D. in ecology and evolution in 1978. She joined Towson University in 1998 to create the Environmental Science and Studies Programs for which she served as director (1998–2016). Her most recent professional work involved developing and presenting climate change curriculum for secondary school educators. Her early research in the U.S. and Cameroon was on agricultural insect pests.