



Annual Meeting of the Pacific Northwest Section of
the Mathematical Association of America
April 9-10, 2010
Seattle University in Seattle, Washington

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Registration for the PNW-MAA meeting is still open, but is subject to a \$10 late fee.

Invited Program Information

Friday night public lecture: "The Shape of Space" Jeff Weeks

When we look out on a clear night, the universe seems infinite. Yet this infinity might be an illusion. During the first half of the presentation, computer games will introduce the concept of a "multiconnected universe". Interactive 3D graphics will then take the viewer on a tour of several possible shapes for space. Finally, we'll see how recent satellite data provide tantalizing clues to the true shape of our universe.

The only prerequisites for this talk are curiosity and imagination. For middle school and high school students, people interested in astronomy, and all members of the Seattle University and surrounding communities.

Saturday morning lecture: "Visual Introduction to Curvature" Jeff Weeks

Physical models and software simulations will introduce participants first to curved surfaces and then to curved 3-dimensional space. The contrasting properties of spherical and hyperbolic geometry will be savored.

Saturday afternoon lecture: "Dimension, Fractals, and Wild Cantor Sets" Gerard Venema

The discovery of unexpected examples forced a reexamination of the concept of dimension in the early twentieth century. Several competing definitions of dimension emerged. They do not all give the same answer when applied to a subset of Euclidean space and do not even necessarily yield integers as answers. (Spaces whose dimension varies, depending on which definition is used, are called fractals.)

In this talk I will take a quick look at the examples mentioned above and review the definitions of topological dimension and Hausdorff dimension from an elementary point of view. Every compact metric space contains a Cantor set whose Hausdorff dimension equals that of the given space, so it is natural to focus on examples of Cantor sets. There is a simple construction that yields Cantor sets in \mathbb{R}^n of dimension s for every real number s in the range $0 \leq s \leq n$. Antoine's necklace is a classic example of a wild Cantor set in \mathbb{R}^3 . I will explain why the Hausdorff dimension of an Antoine's necklace Cantor set must always be at least 1 and how to construct an Antoine's necklace of Hausdorff dimension s for every s in the range $1 \leq s \leq 3$. This is a special case of a much more general theorem that relates Hausdorff dimension to embedding dimension and implies that every wild Cantor set is a fractal.

Saturday banquet talk: "MAA's American Mathematics Competitions: Easy Problems, Hard Problems, History and Outcomes" Steve Dunbar

How do you get bright students hooked on mathematics? How do you keep teachers intellectually engaged and pedagogically innovative? A proven way is to involve them both in mathematics competitions with great problems that span the curriculum. The

Mathematical Association of America has continuously sponsored nationwide high-school level math contests since 1952. The sequence of contests now has 5 different contests at increasing levels of mathematical sophistication. Students who succeed at the top level on these contests become the team representing the U.S. at the annual International Mathematical Olympiad. I'll showcase some interesting, easy and hard contest problems, and a little bit of history. Along the way, I'll comment about the intersection of these contests with the school mathematics curriculum.

Contributed Papers and Student Presentations

Information about the Special Sessions can be found [here](#). Abstracts for special and general paper sessions are due March 1st and should be e-mailed to nordstro@up.edu. Please use the [LaTeX template](#), or a Word document or .pdf that contains the name and affiliations(s) of the presenter and author(s), talk title, and a short description. If you have questions regarding a particular session, please contact one of the session organizers.

Banquet Information

A social hour followed by the banquet will take place in the Campion Ballroom, which is on the first floor of the Campion Residence Hall located south of the main campus.

The banquet will include a seasonal mixed green salad, artisan bread and butter, a choice of beverage, and dessert. There are three choices for the entrée:

Greek Chicken Breast, Baked with honey lemon glaze, Mediterranean orzo, and spinach or broccoli casserole

Cedar-Planked Salmon, Wild salmon, charmoula, wild rice pilaf, and spinach or broccoli casserole.

Cencioni Pasta (Vegetarian), Roasted season vegetables, goat cheese, pine nuts.

Student Social

Mathematical Origami

The intersection of Mathematics and Origami is a beautiful area both from the artistic perspective and the mathematical perspective. Come to the student gathering to get some hands-on practice with mathematical origami. You can build geometric solids with modular origami, a patch of hyperbolic space with a flat piece of paper, and learn how to trisect an angle with origami folds. Instructions, examples, and plenty of paper will be provided, along with pizza and drinks for registered students!

The social will take place from 5:30-7:00 PM on Friday evening. More information about the location will be posted soon.

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