Titles and Abstracts for Friday Talks

09:15 **Principal Speaker** – **Ruth Charney**, Brandeis University

Title: Right-Angled Artin Groups, I

Abstract: *Artin groups, defined by presentations of a simple form, span a wide range of groups from braid groups, to free groups, to free abelian groups. They are closely related to Coxeter groups and mapping class groups and are associated with a variety of geometric objects. After a brief, general introduction to Artin groups, the lectures will focus on a class of Artin groups known as right-angled Artin groups. These groups have proved particularly versatile and interesting, in part because of their actions on CAT(0) spaces.*

10:45 **Craig Guilbault**, University of Wisconsin - Milwaukee

Title: Some group theory arising in high-dimensional manifold topology.

11:15 **Christopher Mooney**, University of Wisconsin - Milwaukee

Title: Cell-like Equivalence and Boundaries of CAT(0) Groups.

13:45 **Justin Smith**, University of Florida

Title: Assouad-Nagata Dimension for Finitely Generated Groups.

14:15 **Leonard Rubin**, University of Oklahoma

Title: Inverse Sequences and Extension Theory.

Abstract: *Extension theory is based on the following concept. Suppose that K is a CW-complex and X is a space having the property that for each closed subset A of X and map $f : A \to K$, there exists a map $F : X \to K$ which is an extension of f. Then we say that K is an absolute extensor for X or that X is an absolute co-extensor for K and denote this by $X \tau K$.*

Recently I. Ivanšić and the author have given a characterization stating conditions on an inverse sequence of stratifiable spaces (this includes all metrizable spaces) under which the limit of the sequence would be an absolute co-extensor for a given CW-complex. These conditions involve only the inverse sequence itself; they make use of the notion of semi-sequences, which seem to play a fundamental role in this theory.

With the characterization noted above, it is now possible to obtain stronger theorems for detecting when $X \tau K$ where K is a given CW-complex and X is the limit of an inverse sequence of stratifiable spaces. We will discuss such results along with one that can detect the property $X \tau K$ under a "local" condition on the given inverse sequence. Although semi-sequences appear in the characterization theorem, they are not involved in the statements of the theorems we shall discuss.

Titles and Abstracts for Saturday Talks

09:15 **Principal Speaker** – **Ruth Charney**, Brandeis University

Title: Right-Angled Artin Groups, II

Abstract: See Friday's talks for Abstract.

10:30 **Frederick Tinsley**, Colorado College (joint with C. Guilbault)

Title: Old-time commutator calculus

Abstract: *In an earlier paper, we gave an example of a high-dimensional ($n \geq 6$) one-ended, inward tame manifold in which the end, ϵ, is not pseudo-collarable. That particular example still exhibits some rather nice properties, the most important being a $\pi_1(\epsilon)$ system $\{J_i\}$ satisfying: if $K_i = (\ker \mu_i : J_i \to J_{i-1})$, then $K_i = [K_i, J_i]$. In this settings similar to this one, it necessarily is the case that the induced homomorphisms $\mu_i* : H_2(J_i) \to H_2(J_{i-1})$ is a surjection.*

We now are able to construct an example of an one-ended inward tame manifold in which the induced maps on second homology (see above) are not surjective. The group theoretic arguments required for this construction have their roots in theorems of Magnus from the 1950's. We hope this will lead to an interesting characterization of inward tame manifolds.

11:00 **Denise Halverson**, Brigham Young University

Title: Length Minimization Problems on Surfaces.

Abstract: *What is the least length path network connecting n points in a surface? This is a classical problem that has come to be known as the Steiner problem. A general method for solving such problems in geodesic surfaces will be discussed. This method will be applied to the hyperbolic plane and the sphere. The problem on the flat torus will also be discussed.*

11:30 **Ranja Roy**, N.Y. Institute of Technology

Title: Replacement Procedures and a Conjecture of Hopf

Abstract: *We introduce a replacement procedure which is a generalization of the hyperbolization procedures considered by Charney, Davis, and Januszkiewicz. The replacement procedures input a proper cubulated complex, and output a stratified space that is frequently aspherical. For the "cross with interval" replacement procedure, we formulate a conjecture whose validity in dimension 2n implies that every 2n-dimensional manifold obtained by this replacement procedure satisfies the Hopf conjecture on the sign of the Euler characteristic. The conjecture is formulated in terms of an inequality involving a sequence of recursively defined numbers. This is a joint work with J. Lafont and B. Kastermans.*

14:00 **David Snyder**, Southwest Texas State University

Title: Knots as processes: embedding knot theory in a formal, computational framework..

14:30 **Tadek Dobrowolski**, Pittsburgh State University

Title: How many translates of a closed nowhere dense set are needed to cover a Polish group?

Titles and Abstracts for Sunday Talks

09:15 **Principal Speaker** – **Ruth Charney**, Brandeis University

Title: Right-Angled Artin Groups, III

Abstract: See Friday's talks for Abstract.

10:30 **Greg Conner**, Brigham Young University

Title: Some open questions in low-dimensional wild fundamental groups

11:00 **Atish Mitra**, University of Tennessee

Title: Hurewicz Theorem for Nagata-Assouad Dimension.

Abstract: *Given a function $f\colon X \to Y$ of metric spaces, its asymptotic dimension $asdim(f)$ is the supremum of $asdim(A)$ such that $A \subset Y$ and $asdim(f(A)) = 0$.*

Our main result is:
Theorem A : $asdim(X) \leq asdim(f) + asdim(Y)$ for any coarse function $f\colon X \to Y$.
This generalizes a result of Bell and Dranishnikov in which f is Lipschitz and X is geodesic. We provide analogs of this theorem for linearly controlled asymptotic dimension and Nagata-Assouad dimension.

This is joint work with Nikolay Brodskiy, Jerzy Dydak, Michael Levin.