SOUTHERN CALIFORNIA FUNCTIONAL ANALYSIS SEMINAR

Saturday, November 17, 2007
2:00 – 4:30 PM

Claremont McKenna College
Davidson Lecture Hall, Adams Hall, Lower Level
(See reverse for map and directions to campus)

2:00 – 3:00 PM, Lecture #1:

GLOBAL STABILITY FOR CONTINUOUS AND DISCRETE DYNAMICAL SYSTEMS

MARIO MARTELLI
CLAREMONT McKENNA COLLEGE

Two conjectures on global asymptotic stability have been recently disproved. The first conjecture, due to Markus-Yamabe (1960), regards continuous and autonomous systems of Differential Equations. The second, due to La Salle (1976), regards autonomous systems of Difference Equations. A counterexample to the first was found in 1997 and a counterexample to the second was discovered in 1998.

However, the story is not that simple. Global asymptotic stability of an equilibrium point can be obtained in the case discussed by Markus-Yamabe when the function that governs the system is continuous, its Gateaux derivative exists except possibly on a linearly countable set S, and the spectrum of the symmetric part of the derivative is strictly contained in the left hand side of the real line.

Similarly, global asymptotic stability can be proved in the case discussed by La Salle when the function is continuous, Gateaux differentiable except possibly on S, and the spectral radius of the matrix obtained by multiplying the Gateaux derivative $F'_G(\mathbf{x})$ with its transpose is strictly smaller than 1.

In this talk I shall present the counterexamples and the proof of the two positive outcomes. I shall also show that the set S cannot be uncountable, even in the case when its Lebesgue measure is 0.

3:30 – 4:30 PM, Lecture #2:

MULTI-BANACH SPACES AND MULTI-BANACH ALGEBRAS

H. G. DALES
UNIVERSITY OF LEEDS, UNITED KINGDOM

I have developed a theory of "multi-Banach spaces"; this involves a sequence of norms on the spaces E^n, where E is a Banach space. The theory is somewhat related to that of operator spaces - but technically has no overlap.

First it gives a new way of looking at the geometry of Banach spaces. Second a key example involves Banach lattices, and so we can generalize some results from that subject. Third we discuss "multi-continuous" linear operators, and define some new (classical) Banach algebras of operators. Fourth, we can give a new abstract notion of orthogonality. Finally, we can formulate an obvious notion of a "multi-Banach algebra", bringing in a generalization of the group algebra $L^1(G)$, and resolve at least one classical problem connected with amenability.

Dinner at a local restaurant will follow the concluding lecture.
For more information, please contact Professor Asuman Aksoy at (909) 607-2769, or via email at asuman.aksoy@cmc.edu.

MAP & DIRECTIONS TO CAMPUS

I-10 WESTBOUND (from San Bernardino)
Stay on I-10 West (toward Los Angeles) until you reach the **Indian Hill/Claremont** exit. Turn right (north) off the exit. You will be on Indian Hill; continue north on Indian Hill for about 1.5 miles until you reach **10th Street.** Turn right on 10th Street and follow it until it ends on **Columbia.** Turn right (south) on Columbia, then left (east) on **9th Street**. Park anywhere on 9th Street. Adams Hall is on the south side of the street, and Davidson Lecture Hall is on the southwest side of the building, on the lower level.

I-10 EASTBOUND (from Los Angeles)
Stay on the I-10 East (toward San Bernardino) until you reach the **Indian Hill/Claremont** exit. Turn left (north) off the exit. You will be on Indian Hill; continue north on Indian Hill for about 1.5 miles until you reach **10th Street.** Turn right on 10th Street and follow it until it ends on **Columbia.** Turn right (south) on Columbia, then left (east) on **9th Street**. Park anywhere on 9th Street. Adams Hall is on the south side of the street, and Davidson Lecture Hall is on the southwest side of the building, on the lower level.

I-210 WESTBOUND (from San Bernardino)
Stay on I-210 West (towards Pasadena) until you reach the **Towne Avenue** exit. Turn left off the exit. You will be on Towne; continue south for about one mile until you reach **Foothill Boulevard**. Turn left on **Foothill Boulevard**. Continue east on Foothill for about one mile and turn right onto **Dartmouth Avenue**. Continue south on Dartmouth for three blocks to **10th Street** and turn left. Follow 10th Street to **Columbia** and turn right. Then turn left (east) on **9th Street** and park anywhere on 9th Street. Adams Hall is on the south side of the street, and Davidson Lecture Hall is on the southwest side of the building, on the lower level.

I-210 EASTBOUND (from Pasadena)
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Adams Hall is
#5 on map below