

Seminar & Events Bulletin: Student Analysis
01-01-2012 to 06-30-2012

Thursday, January 19, 2012

5:10pm-6:00pm **Student Analysis** -- William Gignac (University of Michigan) *Hardy Spaces: Introduction* -- 2866 EH

Thursday, January 26, 2012

5:10pm-6:00pm **Student Analysis** -- Purvi Gupta (University of Michigan) *Hardy Spaces: More on Complex Analysis* -- 2866 East Hall

Thursday, February 02, 2012

5:10pm-6:00pm **Student Analysis** -- Rafe Kinsey (University of Michigan) *Hardy Spaces: The Real Harmonic Analysis Perspective* -- 2866 East Hall

Thursday, February 09, 2012

5:10pm-6:00pm **Student Analysis** -- Jen Beichman (University of Michigan) *Paraproducts: History and Development* -- 2866 East Hall

Thursday, February 16, 2012

5:10pm-6:00pm **Student Analysis** -- Jennifer Beichman (University of Michigan) *Paraproducts and the T_1 theorem* -- 2866 East Hall

Wednesday, April 11, 2012

4:10pm-5:00pm **Student Analysis** -- Tom Ngo () *Fourier Analysis via the Heisenberg Group* -- 237 Dennison

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Abstracts

Student Analysis

Thursday, January 19, 2012, 5:10pm-6:00pm

2866 EH

William Gignac (University of Michigan)

Hardy Spaces: Introduction

This is the first in a three lecture series on Hardy spaces, and is meant to be introductory. I will outline some of the basic results about Hardy spaces, hopefully setting the groundwork for the next two lectures, which will advance the topic in two separate directions. This will be more of a survey talk than a proofs talk, with the goal of developing intuition by anchoring the presented results to principles from complex and harmonic analysis.

Student Analysis

Thursday, January 26, 2012, 5:10pm-6:00pm

2866 East Hall

Purvi Gupta (University of Michigan)

Hardy Spaces: More on Complex Analysis

This is the second in a three-lecture series on Hardy spaces, and will mostly be a survey talk. I will expand on some themes from last week's talk --- especially the Banach space structure of Hardy spaces, and mention some applications to planar geometry. If time permits, we will look at some non-trivial consequences of generalizing these spaces to higher (complex) dimensions.

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Thursday, February 02, 2012, 5:10pm-6:00pm

2866 East Hall

Rafe Kinsey (University of Michigan)

Hardy Spaces: The Real Harmonic Analysis Perspective

I will introduce Hardy spaces from the real harmonic analysis perspective. First, I will discuss how these spaces are defined, using only tools of real analysis, in a way that generalizes the classical definitions using complex analysis. Then I will discuss the useful atomic decomposition of Hardy spaces, which allows us to characterize elements as appropriate sums of relatively easy "atoms". (These atoms were some of the key elements in the development of wavelet theory in the 1980s.) Finally, I will discuss why these spaces are so useful in harmonic analysis, with H^1 serving as a good replacement for L^1 in terms of the behavior of singular integral operators, interpolation results, and duality (with BMO replacing L^∞). This talk will be independent of the earlier two talks about complex Hardy spaces.

Student Analysis

Thursday, February 09, 2012, 5:10pm-6:00pm

2866 East Hall

Jen Beichman (University of Michigan)

Paraproducts: History and Development

This talk will present a brief history of paraproducts (a useful harmonic analysis tool used in many fields) and lay the groundwork for several talks on their applications. No previous knowledge of harmonic analysis is necessary.

(Follow-up talks might discuss the applications to nonlinear PDE and to the $T(1)$ theorem in harmonic analysis.)

Student Analysis

Thursday, February 16, 2012, 5:10pm-6:00pm

2866 East Hall

Jennifer Beichman (University of Michigan)

Paraproducts and the T_1 theorem

This talk is the second in a series on paraproducts. Starting from the foundations laid in the previous talk, we will prove one of the key theorems of harmonic analysis, the T_1 theorem. If there is time, we will discuss some of the applications of this powerful theorem.

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Wednesday, April 11, 2012, 4:10pm-5:00pm

237 Dennison

Tom Ngo ()

Fourier Analysis via the Heisenberg Group

In this talk we will look at some aspects of classical Fourier analysis from the representation theory point of view. The Weil-Brezin map is a magical bridge that connects Fourier analysis on the real line with the unitary representations of the Heisenberg group. As an interesting application, we will solve the problem of diagonalising Fourier operator on the Hilbert space $L^2(\mathbb{R})$ of square-integrable functions on the reals.