

# Bellman function mini-conference

University of Cincinnati

January 31, 2011

This satellite conference is aimed at two overlapping constituencies:

- those participants of the Ohio River Analysis Meeting (January 29-30, 2011) who work on and/or are interested in various Bellman function-related questions;
- the participants of the Taft Research Seminar “*Bellman function method in harmonic analysis*” (<http://homepages.uc.edu/~slavinld/TRS/>), taking place at the University of Cincinnati in Winter 2011.

## TENTATIVE PROGRAM

Note: the talks will start at 10am. We have secured an all-day meeting space at the Taft House, but the blackboard situation there is not ideal. A better equipped location may become available on Monday morning, when the university reopens, but we may have to move from one room to another a couple of times. Let us meet at 9:45am by the main entrance to the Old Chemistry building (for the out-of-town participants: this is the building next to the one where the main conference is being held. The Mathematics department is housed in Old Chemistry). Further updates will be sent by e-mail and announced in person.

The schedule below is not meant to be strict. The speakers may take less or more than the allotted time.

- 10:00: Fedor Nazarov (Wisconsin). *The  $A_1$  conjecture for the Hilbert transform is false*

Abstract: I, Volberg and Treil recently showed that the norm of the Hilbert transform, as an operator from the weighted space  $L^1(w)$  to  $L^{1,\infty}(w)$ , is not controlled by the first power of the  $A_1$ -norm of the weight and a logarithmic correction factor is needed. I'll present the main ideas of the Bellman function proof of this statement.

- 11:00: Alex Stokolos (Georgia Southern). *Bellman Function for the Dyadic Maximal Operator: the  $L^2 \rightarrow L^1$  case*

Abstract: The Bellman Function for the Dyadic Maximal Operator acting from  $L^2$  to  $L^1$  was found by A. Melas [1] using combinatorial and covering reasoning. Following the scheme of [2] we have found an alternative proof based on Monge-Ampère equation. I will outline that proof. This is a joint work with Viktor Maymeskul and Shijun Zheng.

[1] A. Melas. Sharp general local estimates for dyadic-like maximal operators and related Bellman functions. *Advances in Mathematics*, 220 (2009), no. 2, 367–426.

[2] L. Slavin, A. Stokolos and V. Vasyunin. Monge-Ampère equations and Bellman functions: the dyadic maximal operator. *C. R. Math. Acad. Sci. Paris* 346 (2008), no. 9-10, 585–588.

- Noon: Vasily Vasyunin (The Steklov Institute and Cincinnati). *How to recognize the Bellman function among all solutions of the Monge–Ampère equation*
- 1:00: Lunch
- 2:00: Daewon Chung. *Weighted inequalities for multivariable dyadic paraproducts*
- 2:30: Oleksandra Beznosova. *Buckley's inequality and  $RH_1$*
- 3:00: Problem session