

**Emphasis Year**  
*on Valuation Theory and its Applications*  
September 2011 – April 2012

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**Research topics.**

- Valuation Theory in positive and mixed characteristic
- Valuation Theory in real algebra and quadratic form theory
- The structure of spaces of places
- Valued function fields and local uniformization
- Artin-Schreier defect extensions

**The list of projects includes:**

- 1) The structure of spaces of places of rational function fields (generalizations of the “Valuative Tree” results of Favre and Jonsson). Topologies, ultrametric and tree structure of such spaces. Generalizations to algebraic function fields.
- 2) Spaces of  $\mathbb{R}$ -places: their structure, topologies, dimension, realizability of compact Hausdorff spaces as spaces of  $\mathbb{R}$ -places. Orderings and  $\mathbb{R}$ -places on power series rings in two variables.
- 3) Structure theorems for valued function fields and their application to local uniformization. Proofs for inseparable local uniformization, and generalizations.
- 4) Artin-Schreier defect extensions: criteria for dependent and independent AS defect extensions, their significance for resolution of singularities, AS defect extensions of rational function fields. Generalizations to mixed characteristic.

The activities of the emphasis year will be based on background and results provided by:

- the Tenth Colloquiumfest, Istanbul, June 13 and 14, 2011, and the Workshop on Valuation Theory in Positive Characteristic, Sirince, June 15–18, 2011,
- the Second International Valuation Theory Conference, Segovia, Spain, July 18 to 29, 2011.

### **Participants.**

#### **Professors:**

Franz-Viktor Kuhlmann (Saskatoon)

Katarzyna Kuhlmann (Katowice)

Murray Marshall (Saskatoon)

#### **Long- and short-term postdoctoral fellows:**

Mohammad Moghaddam (Teheran)

Asim Naseem (Lahore)

Samar El Hitti (CUNY)

#### **Graduate students (Saskatoon):**

Mehdi Ghasemi (supervised by Murray Marshall)

Josnei Novacoski (supervised by F.-V. Kuhlmann)

Stavros Stavrou (supervised by M. Bremner)

Izabela Vlahu (supervised by F.-V. Kuhlmann)

#### **Graduate student, visiting in March of 2012:**

Anna Blaszcok (Katowice, co-supervised by F.-V. Kuhlmann and A. Sladek)

#### **Visitors:**

Koushik Pal (Berkeley), visiting in January of 2012

Mark Spivakovsky (Toulouse) and Maria del Rosario Gonzalez-Dorrego (Universidad Autonoma de Madrid), visited in October of 2011

During this Emphasis Year, the **Eleventh Colloquiumfest** will take place on February 3 and 4. For more information, see the **Valuation Theory Home Page** at <http://math.usask.ca/fvk/Valth.html>