

# Vilislav Boutchaktchiev

Institute of Mathematics and Informatics  
Bulgarian Academy of Sciences  
Acad. G. Bonchev Street, Block 8, Room 564  
1113 Sofia, Bulgaria  
vboutcha@math.bas.bg  
Office: +359 2 979 2819  
Cell: +359 892048327

## ACADEMIC APPOINTMENTS

**06/2013 – present** *Assistant Professor*, Bulgarian Academy of Sciences, Institute of Mathematics and Informatics, Sofia, Bulgaria.

**06/2009 – 12/2011** *Graduate Researcher*, University of Utah, David Eccles School of Business, Finance Department

**08/2005 – 06/2009** *Lecturer*, University of Miami, Department of Mathematics

**09/2004 – 06/2005** *Lecturer*, University of California, Irvine, Department of Mathematics

**09/1997 – 06/2004** *Graduate Teaching Assistant*, University of California, Irvine, Department of Mathematics

**01/1996 – 05/1997** *Junior Research fellow*, Bulgarian Academy of Sciences, Institute of Mathematics

## EDUCATION

**M.Phil.** University of Utah, December 2011, Business Administration (Finance). Research Papers: 1) *Risk v. Overreaction and Migration*, 2) *Momentum and Payout Smoothing*. Advisor: M. Cooper.

**Ph.D.** University of California, Irvine, June 2004, Mathematics. Dissertation title: Hodge theory on Brill-Noether stacks. Advisor: L. Katzarkov.

**M.S.** Sofia University “St. Kliment Ohridski”, Sofia, Bulgaria, June 1995, Mathematics. Thesis title: “Applications to double flag fibrations”. Advisor: V. Tsanov.

## DISSERTATION

**Title:** Hodge Theory on Brill-Noether Stacks.

**Advisor:** L. Katzarkov.

For a given principal bundle  $E$  over a smooth algebraic curve  $X$  over  $\mathbb{C}$ , consider the corresponding pro-algebraic group  $\mathcal{G}$ , and the functional algebra  $\mathcal{O}(\mathcal{G})$ . I define a mixed Hodge structure on  $\mathcal{O}(\mathcal{G})$ . My definition is compatible with the work of R. Hain and C. Simpson on non-abelian Hodge structure on the parametrizing space of flat  $G$ -bundles on  $X$ .

Further, I use this approach for defining a MHS on a Brill–Noether stack  $\kappa(G, \rho, n)$ , i.e., the parametrizing space of all triples  $(E, \theta, \eta)$ , where  $E$  is a  $G$ -bundle,  $\theta$  is a holomorphic flat connection and  $\eta \in H^n(X, E \times^G V)$ .

**TEACHING EXPERIENCE****Lecturer**

Lectured classes of sizes 10–120 students, designed courses, examined and graded. Coordinated and supervised teaching assistants and graders.

*Courses Taught at University of Miami:*

Calculus — all levels, Precalculus — all levels, Linear Algebra, Discrete Mathematics, Probability and Statistics.

*Courses Taught at University of California, Irvine:*

Precalculus, Calculus of one variable — all levels, Multivariable Calculus, Discrete Mathematics, Complex Analysis and Applications.

**Teaching Assistant**

Lead discussion sections and some lectures, graded students' work, organized student presentation sessions, conducted weekly tests.

*Courses at University of California, Irvine:*

Precalculus — all levels, Calculus — all levels, Ordinary Differential Equations, Linear Algebra, Abstract Algebra, Numerical Analysis, Discrete Mathematics, Nonlinear Programming, Linear Programming.

*Courses at Sofia University:*

Calculus — All levels, Real Analysis — All levels (including Fourier analysis and Lebesgue integration), Ordinary Differential Equations, Linear Algebra.

**OUTREACH ACTIVITIES**

**Math Circles at UCI, 1997 – 2003.** Under the supervision of L. Katzarkov, maintained website, conducted discussions and tests, prepared lecture notes and, occasionally, lectured.

**California State Summer School for Mathematics and Science (COSMOS), 1999 – 2003.** A summer program for fork with gifted high-school students. Gave lectures and lead discussion sessions. Prepared lecture notes and website, conducted and graded tests.

**RESEARCH EXPERIENCE**

**Risk v. Overreaction and Migration, 2009–2010.** An empirical asset pricing study on the effect of intangible information over the market prices

**Momentum and Payout Smoothing, 2010–2011.** Statistical test of the hypothesis that payout smoothing causes market momentum.

**Application of Nonabelian Hodge structure to Torelly type results, 2004 – present.** Applications of the results from my dissertation.

**Hodge Structure on Brill-Noether Stacks 2002 – 2004.** Dissertation work.

**Applications of double flag fibrations, 1994 – 1995.** M.S. thesis work.

**FELLOWSHIPS AND AWARDS**

*Connelly Award*, June 2004. Given by UCI Math Department to graduating PhD Students for contributions to teaching and research.

*Dean's Graduate Fellowship*, January – June, 2000. UCI School of Physical Sciences.

**CONFERENCE AND SEMINAR PRESENTATIONS**

“Hodge structures and Stacks” *Geometry Seminar*, November 2005, University of Miami.

“Fiber product in weak 2-categories and nonabelian Hodge theory”, *Algebra Seminar*, January 2003, University of California, Irvine.

“Double quotient structure of Brill-Noether stacks”, *Communications in Arithmetic Fundamental Groups and Galois Theory* October, 2001, RIMS, Kyoto, Japan.

“The number of linear subspaces in a general projective hypersurface”, *International Conference in Geometry and Theoretical Physics*, June, 1996, Zlatograd, Bulgaria.

**TECHNICAL EXPERIENCE**

**Programming:** Java, C++, Matlab, Maple, SAS, Stata

**Operating Systems:** Unix, Linux, MS Windows

**Other:** L<sup>A</sup>T<sub>E</sub>X, MS Office, HTML, CSS.

**RESEARCH INTERESTS**

Financial Mathematics

Statistics

Algebraic Geometry

Hodge Theory

**PROFESSIONAL MEMBERSHIP**

American Mathematical Society (AMS).

**LANGUAGES**

Bulgarian, Russian (reading), French (reading).

**REFERENCES**

1. Ludmil Katzarkov, Ph.D., Department of Mathematics, University of Miami, Miami, Florida, 305-284-2279, lkatzark@math.uci.edu.
2. Shulim Kaliman, Ph.D. Department of Mathematics, University of Miami, Miami, Florida, 305-284-2195, kaliman@math.miami.edu.
3. Mirroslav Yotov, Ph.D. Department of Mathematics, Florida International University, Miami, Florida, 305-348-3170, yotovm@fiu.edu.
4. Leticia Oropessa, D.A., Department of Mathematics, University of Miami, Miami, Florida, 305-284-2116, l.oropessa@math.miami.edu.
5. Shmuel Baruch, Ph.D., Finance Department, David Eccles School of Business, University of Utah, Salt Lake City, Utah, 801-581-7683, shmuel.baruch@business.utah.edu.