CURRICULUM VITAE

Richard M. Crew

Address – 120 NE 8^{th} St.
Gainesville, FL 32601
[352]–375–0682

Department of Mathematics
University of Florida
Gainesville, FL 32611
[352]–392–0281 Ext. 272

email: crew@math.ufl.edu

Area of Specialization – p-adic analysis, Arithmetic geometry

Birth – August 25, 1954
Glen Ridge, New Jersey

Education – Ph. D., Princeton University, 1981
M.A., Princeton University, 1977
A.B., Bowdoin College, 1976

Employment history – Assistant Professor, Boston University, 1981–1986
NSF Postdoctoral Fellow, Harvard University, 1986–1988
Visiting Assistant Professor, University of Minnesota, 1988–1990
Associate Professor, University of Florida, 1990–present

Ph.D. Students – Prabhu Venkataram (Ph.D 2008)
Yuri Morofushi (Ph.D 2010)
Andrew Kriehn (Ph.D 2021)
Harold Polo (Ph.D 2023)
Dario Teran (Ph.D expected 2025)

Visiting positions – Professeur d'échange, Université de Paris-Sud, May – June 1986
Professeur invité, Université de Rennes, May 1990
Visitor, Universität Köln, January – February 1993
Professeur invité, Université de Paris XIII, June 1995
Professeur invité, Université de Paris-Sud and the Institut Henri Poincaré – June 1997
Professore visitatore, Università di Padova – November 1999
Professore visitatore, Università di Padova – June 2001
Professeur invité, Université de Rennes, June 2002
JSPS fellow, Hiroshima Univ. and Chiba Univ., May-June 2004.
Professeur invité, Université de Rennes, March 2007.
Visitor, Oxford University, February 2016.
Professeur invité, Université de Rennes, March 2016.
Professore visitatore, Università di Padova – April 2016.
Professeur invité, Université de Rennes, May 2018.
Visitor, Institut Fourier (Grenoble) May 2018.
Professeur invité, Université de Rennes, May 2020.
Visitor, Kavli IPMU, Tokyo Japan, September – December 2024.

Grant support – NSF, 1994-97, $71,000, PI
NSA, 2002-2004, $29,000, PI
NSA, 2006-2008, $36,000, PI
CoPI on grants for the special year in combinatorics and number theory,
NSF, NSA, Number Theory Foundation.
NSA, 2009-2010, $43,000, PI

Conferences organized – "Arithmetic Geometry, Gainesville 2005," February 2005.

Publications and preprints

[1] *Etale p-covers in characteristic p*, Compositio Mathematica **52** (1984) pp 31–45.

[2] *On torsion in the slope spectral sequence*, Compositio Mathematica **56** (1985) pp 79–86.

[3] *Nonsingular Holomorphic Flows* (with David Fried), Topology **25** (1986) pp 471–473.

[4] *Specialization of crystalline cohomology*, Duke Mathematical Journal **53** (1986) pp 749–757.

[5] *L-functions and geometric Iwasawa theory*, Inventiones Mathematicae **88** (1987) pp 395–403.

[6] *L-functions of p-adic characters and a conjecture of Katz*, in Canadian Mathematical Society publications **7** (1987) pp 37–53.

[7] *F-Isocrystals and p-adic representations*, in *Algebraic Geometry – Bowdoin 1985* Proceedings of Symposia in Pure Mathematics **37** vol. 2 (1987) pp 111–138.

[8] *Universal extensions and p-adic periods of elliptic curves*, Compositio Mathematica **73** (1990) pp 107–119.

[9] *The p-adic monodromy of the universal abelian scheme*, in *p-adic methods in Number Theory and Algebraic Geometry*, Contemporary Mathematics **133** (1992) AMS.

[10] *F-isocrystals and their monodromy groups*, Annales Scientifique de l'Ecole Normale Supérior 4^e sér. **25** (1992) pp 429–464.

[11] *Kloosterman sums and the monodromy of a p-adic hypergeometric equation*, Compositio Mathematica **91** (1994) pp 1–36.

[12] *Differential Galois theory of regular singular p-adic differential equations*, Mathematische Annalen **305** (1996) pp 45–64.

[13] *Finiteness theorems for the cohomology of an overconvergent isocrystal on a curve*, Annales Scientifique de l'Ecole Normale Supérior 4^e sér. **31** (1998) pp 717–763.

[14] *Canonical Extensions, Irregularities, and the Swan Conductor*, Mathematische Annalen **316** (2000) pp 19–37.

[15] *Crystalline Cohomology of Singular Varieties*, in *Geometric Aspects of Dwork Theory*, ed. Adolphson et al., W. de Gruyter 2004.

[16] *Arithmetic $\mathcal{D}$-modules on a formal curve*, Mathematische Annalen **336** (2006) pp 439–448.

[17] *Arithmetic $\mathcal{D}$-modules on the unit disk*, Compositio Mathematica **148** (2012) pp 227-268.

[18] *Rigidity and Frobenius Structure*, Documenta Mathematica **22** (2017), pp 287–296.

[19] (with Tomoyuki Abe) *Integral p-adic cohomology theories*, International Mathematics Research Notices, `https://doi.org/10.1093/imrn/rnad140` (2023).

[20] *Arithmetic D-modules on noetherian formal schemes*, preprint. Available at

`https://arxiv.org/abs/1701.01324.pdf`

[21] *Weil groups and F-isocrystals*, preprint. Available at

`https://arxiv.org/pdf/1710.05707.pdf`.

[22] (with Andrea Pulita) *Duality for differential equations on Berkovich curves*, in preparation.

Invited Lectures since 1999 (selected)

"Lectures on Swan conductors and singularities of differential equations," series of 5 lectures at the Università di Padova, November 1999.

"The p-adic Swan Representation," University of Arizona, January 2001.

"Comparison Theorems for Rigid Cohomology," Universitá di Padova, June 2001.

"Cohomologie Cristalline des Variétés singulières," Université de Rennes I, June 2002.

"Vanishing Cycles in Rigid Cohomology," AMS Meeting, Phoenix AZ February 2003.

"Algebraic Differential Equations and Irregularity," Hiroshima Univ. Mathematics Colloquium, May 2004.

"Arithmetic D-modules on the Unit disk," Hiroshima University, May 2004 (two talks).

"Arithmetic D-modules on the Unit disk," Nagoya University, June 2004.

"Arithmetic D-modules on the Unit disk," Kyoto University, June 2004.

"Arithmetic D-modules on the Unit disk," Tokyo University, June 2004.

"Arithmetic D-modules on the Unit disk," Conference on p-adic differential equations, Univ. Münster (Germany), February 2005.

"p-adic Weil II," Conference on p-adic differential equations and rigid cohomology, Univ. Rennes (France), June 2005.

"Rings of p-adic differential operators on tubes," Conference in honor of Gilles Christol, Bressanone Italy, Sept. 6–9, 2008.

"Lectures on p-adic monodromy," International Summer School on p-adic cohomology theories, University of Mainz, Germany, September 29 – October 1, 2008 (6 one hour lectures).

"Rings of p-adic differential operators on tubes," Conference on Recent Progress in Arithmetic D-modules theory, IRMA (Univ. of Strasbourg), Strasbourg France, October 3, 2008.

"F-crystals on the line," Max Planck Institute for Mathematics, Bonn Germany, 26 December 2012.

"Rings of arithmetic differential operators on tubes," Conference "p-adic Cohomology and Arithmetic Applications," BIRS (Banff), Alberta, CA, Oct. 3 2017.

"Arithmetic D-modules on adic formal schemes," Oxford University, UK, Dec. 5 2017.

"Convergent isocrystals and arithmetic D-modules," IRMAR, Univ. Rennes I, Rennes France, May 15 2018.

"p-adic local systems," Institut Fourier, Grenoble, France, May 17 2018.

"Nilpotent arithmetic D-modules," Conference "Representation theory and D-modules," Univ. Rennes I, 3–7 June 2019. Conference website:
`https://www.lebesgue.fr/en/content/sem2019-Dmod`

"Nilpotent arithmetic D-modules," Conference "Over and around sites in characteristic p," Univ. of Padua (Italy), 18–20 September 2019. Conference website:
`https://events.math.unipd.it/overlestum/`

"Differential equations on Berkovich curves," Conference "Tropical Geometry, Berkovich Spaces, Arithmetic D-modules and p-adic Local Systems," Imperial College of London, 8-10 December 2020. Conference website:

`https://www-fourier.ujf-grenoble.fr/~pulitaa/Imperial-Conference/Imperial-Conference.html`

"Integral p-adic cohomology theories," Centre Lebesgue, Univ. Rennes I, France, June 27, 2022

"Differential equations on Berkovich curves," Conference "Around p-adic cohomologies," Padua, Italy, Sept. 20, 2022. Conference website:
`https://docenti.math.unipd.it/dagnolo/Padova2022/`

"Duality for p-adic differential equations on curves,", Dwork Seminar Series (international seminar running over Zoom, organized by C. Douglas Haessig, Univ. of Arizona), March 8 2023. Seminar website:
`https://sites.google.com/view/dworkseminar/home`.

"Differential equations on Berkovich curves," Dept. of Mathematics, Univ. of Exeter, UK, May 18, 2023.

"Duality for differential equations on Berkovich curves," Centre Lebesgue, Univ. Rennes I, France May 26, 2023.

"Arithmetic differential operator rings on tubes, Oct. 22, 2024, at the conference "p-adic cohomology and arithmetic geometry," Oct. 21–25, Tohoku Univ., Sendai Japan. Conference website:
`https://sites.google.com/mail.sci.tohoku.ac.jp/yamauchi/`