

## PUBLICATIONS

ALEXANDRU BUIUM

### 1. RESEARCH MONOGRAPHS

- [1] Differential Function Fields and Moduli of Algebraic Varieties, Lecture Notes in Math. 1226, Springer 1986.
- [2] Differential Algebraic Groups of Finite Dimension, Lecture Notes in Math. 1506, Springer 1992.
- [3] Differential Algebra and Diophantine Geometry, Hermann, Paris, 1994.
- [4] Arithmetic Differential Equations, Mathematical Surveys and Monographs 118, AMS, 2005.
- [5] Foundations of Arithmetic Differential Geometry, Mathematical Surveys and Monographs 222, AMS, 2017.

### 2. TEXTBOOKS

- [1] Mathematics: a Minimal Introduction, CRC Press, 2013.

### 3. PAPERS PUBLISHED

- [1] Espaces projectifs anisotropes et diviseurs amples, C. R. Acad. Sci. Paris Sér. I Math. 292 (1981), no. 12, 585–586.
- [2] Sur les variétés dont le nombre de Picard est égal à 1, C. R. Acad. Sci. Paris Sr. I Math. 294 (1982), no. 3, 135-137.
- [3] Ritt schemes and torsion theory. Pacific J. Math. 98 (1982), no. 2, 281-293.
- [4] Degree of the fibres of an elliptic fibration. Ann. Inst. Fourier (Grenoble) 33 (1983), no. 1, 269-276.
- [5] Sur le nombre de Picard des revêtements doubles des surfaces algébriques, C. R. Acad. Sci. Paris Sér. I Math. 296 (1983), no. 8, 361-364.
- [6] Sur le discriminant des sections d'une variété projective singulière par des hypersurfaces de degré élevé, C. R. Acad. Sci. Paris Sér. I Math. 298 (1984), no. 4, 67-70.
- [7] Class groups of differential function fields. J. Algebra 89 (1984), no. 1, 56-64.
- [8] On surfaces of degree at most  $2n + 1$  in  $\mathbb{P}^n$ . Algebraic geometry (Bucharest 1982), Lecture Notes in Math., 1056, Springer, Berlin, 1984, 47-67.
- [9] Corps différentiels et modules des variétés algébriques, C. R. Acad. Sci. Paris Sér. I Math. 299 (1984), no. 19, 983-985.
- [10] Killing divisor classes by algebraisation. Ann. Inst. Fourier (Grenoble) 35 (1985), no. 2, 107-115.
- [11] Corps de définition des variétés algébriques et théorie de Galois pour les corps différentiels, C. R. Acad. Sci. Paris Sr. I Math. 300 (1985), no. 18, 627-629.
- [12] A note on the class group of surfaces in 3-space. J. Pure Appl. Algebra 37 (1985), no. 3, 229-235.

- [13] Movable singularities and differential Galois theory. Proceedings of the conference on algebraic geometry (Berlin, 1985), 74-80, Teubner-Texte Math., 92, Teubner, Leipzig, 1986.
- [14] Fields of definition of algebraic varieties in characteristic zero. *Compositio Math.* 61 (1987), no. 3, 339-352.
- [15] (with Takeuchi, M.) Rigidity of maps from Hopf algebras to group algebras. *J. Algebra* 118 (1988), no. 1, 14-19.
- [16] Birational moduli and nonabelian cohomology. *Compositio Math.* 68 (1988), no. 2, 175-202.
- [17] Birational moduli and nonabelian cohomology. II. *Compositio Math.* 71 (1989), no. 3, 247-263.
- [18] Dérivations sur les groupes algébriques, *C. R. Acad. Sci. Paris Sér. I Math.* 309 (1989), no. 9, 605-607.
- [19] Splitting differential algebraic groups. *J. Algebra* 130 (1990), no. 1, 97-105.
- [20] Intersections in jet spaces and a conjecture of S.Lang, *Annals of Math.* 136 (1992), 583-593.
- [21] Geometry of differential polynomial functions I: algebraic groups, *Amer J. Math.* 115, 6 (1993), 1385-1444.
- [22] Effective bound for the geometric Lang conjecture, *Duke Math. J.*, 71, 2 (1993), 475-499.
- [23] A finiteness theorem for isogeny correspondences, in: *Journées de Geometrie Algebrique d'Orsay 1992*, Asterisque 218, 1993.
- [24] (with F.Voloch) Integral points on abelian varieties over function fields of characteristic zero, *Math. Ann.* 297 (1993), 303-307.
- [25] Geometry of differential polynomial functions II: algebraic curves, *Amer J. Math.* 116, 4, (1994), 785-819.
- [26] The abc theorem for abelian varieties, *Intern. Math. Research Notices* 5 (1994), 219-233.
- [27] On a question of B.Mazur, *Duke Math. J.*, 75, 3, (1994), 639-644.
- [28] Geometry of differential polynomial functions III: moduli spaces, *Amer J. Math.* 117 (1995), 1-73.
- [29] (with F.Voloch) Reduction of the Manin map modulo p, *Crelle J.*, 460 (1995), 117-126.
- [30] Differential characters of abelian varieties over p-adic fields, *Invent. Math.*, 122, 2, (1995), 309-340.
- [31] Uniform bound for generic points of curves in tori, *Crelle J.*, 469 (1995), 211-219.
- [32] (with F.Voloch) Mordell conjecture in characteristic p: an explicit bound, *Compositio Math.*, 103, (1996), 1-6.
- [33] Geometry of p-jets, *Duke Math. J.*, 82, 2, (1996), 349-367.
- [34] An approximation property for Teichmüller points, *Math. Research Letters*, 3 (1996), 453-457.
- [35] Differential characters and characteristic polynomial of Frobenius, *Crelle J.*, 485 (1997), 209-219.
- [36] (with A. Pillay) A gap theorem for abelian varieties over differential fields, *Math. Research Letters* 4, 211-219 (1997).
- [37] Differential algebraic geometry and diophantine geometry: an overview, in: *Symposia Math.* 37, Cambridge U.P., 1997.

- [38] Arithmetic analogues of derivations, *J. Algebra*, 198, (1997), 290-299.
- [39] Intersection multiplicities on abelian varieties, *Math. Ann.* 310 (1998), 653-659.
- [40] Differential subgroups of simple algebraic groups over  $p$ -adic fields, *Amer. J. Math.* 120 (1998), 1277-1287.
- [41] (with P. Cassidy) Differential algebraic geometry and differential algebraic groups, in: *Collected Works of Ellis Kolchin*, AMS, 1999.
- [42] Differential Modular Forms, *Crelle J.*, 520 (2000), 95-167.
- [43] Continuous  $p$ -adic functions and  $p$ -derivations, *J. Number Theory*, 84 (2000), 34-39.
- [44] Infinitesimal Mordell-Lang, *J. Number Theory* 90 (2001), 185-206.
- [45] (with M. Barcau) Siegel differential modular forms, *International Math. Res. Notices*, 2002, No. 28, pp.1459-1503.
- [46] Quotients of algebraic varieties by Zariski dense equivalence relations, in: *Parshin Festschrift*, Zarhin and Vostokov Eds., *Contemporary Math.*, Vol. 300, AMS (2002), 59-97.
- [47] (with K. Zimmerman) Homogeneous  $p$ -differential polynomials, *J. Algebra*, 269 (2003), 492-507.
- [48] Differential modular forms on Shimura curves, I, *Compositio Math.* 139 (2003), 197-237.
- [49] Differential modular forms on Shimura curves, II: Serre operators, *Compositio Math.* 140 (2004), 1113-1134.
- [50] Pfaffian equations satisfied by differential modular forms, *Math. Res. Letters* 11 (2004), 453-466.
- [51] Geometry of Fermat Adeles, *Trans. AMS* 357, 3 (2005), 901-964.
- [52] (with K. Zimmerman) Differential orbit spaces of discrete dynamical systems, *Crelle J.* 580 (2005), 201-230.
- [53] Complex dynamics and invariant forms mod  $p$ , *International Math. Res. Notices* 31 (2005), 1889-1899.
- [54] Finiteness results in differential algebraic geometry and diophantine geometry, chapter in: *CRM Monograph Series 24*, AMS, 2005.
- [55] A differential equation satisfied by the arithmetic Kodaira-Spencer class, *J. Number Theory* 119 (2006), 297-306.
- [56] Correspondences, Fermat quotients, and uniformization, in: *Groupes de Galois arithmétiques et différentiels*, *Seminaires et Congrès 13*, Société Mathématique de France, (2007), 70-89.
- [57] Differential eigenforms, *J. Number Theory* 128 (2008), 979-1010.
- [58] (with B. Poonen) Independence of points on elliptic curves arising from special points on modular and Shimura curves, I: global results, *Duke Math. J.*, 147, 1 (2009), 181-191.
- [59] (with B. Poonen) Independence of points on elliptic curves arising from special points on modular and Shimura curves, II: local results, *Compositio Math.*, 145 (2009), 566-602.
- [60] (with S. Simanca) Arithmetic differential equations in several variables, *Annales Inst. Fourier*, 59, 7 (2009), 2685-2708 (volume dedicated to B. Malgrange).
- [61] (with S.R. Simanca) Arithmetic Laplacians, *Advances in Math.* 220 (2009), 246-277.

- [62] (with S. R. Simanca) Arithmetic partial differential equations I, *Advances in Math.* 225 (2010), 689-793.
- [63] (with S. R. Simanca) Arithmetic partial differential equations II, *Advances in Math.*, 225 (2010), 1308-1340.
- [64] (with C. Ralph and S.R. Simanca) Arithmetic differential operators on  $\mathbb{Z}_p$ , *J. Number Theory* 131 (2011), pp. 96-105.
- [65] (with J. Borger) Differential forms on arithmetic jet spaces, *Selecta Mathematica* 17, 2 (2011), pp. 301-335.
- [66] Differential characters on curves, in: *Number Theory, Analysis and Geometry: In Memory of Serge Lang*, D. Goldfeld et al. Editors, Springer, 2011, pp. 111-123.
- [67] (with A.Saha) Differential overconvergence, in: *Algebraic methods in dynamical systems; volume dedicated to Michael Singer's 60th birthday*, Banach Center Publications, Vol 94, 99-129 (2011).
- [68] (with A.Saha) Hecke operators on differential modular forms mod  $p$ , *J. Number Theory* 132 (2012), 966-997.
- [69] (with A. Saha) The ring of differential Fourier expansions, *J. of Number Theory* 132 (2012), 896-937.
- [70]  $p$ -jets of finite algebras, I:  $p$ -divisible groups, *Documenta Math.* 18 (2013) 943-969.
- [71]  $p$ -jets of finite algebras, II:  $p$ -typical Witt rings, *Documenta Math.* 18 (2013) 971-996.
- [72] Galois groups arising from arithmetic differential equations, in: *Geometric and differential Galois theories*, D. Bertrand et. al. Eds., Séminaires et Congrès, Vol. 27, Soc. Math. France, 2013, pp. 13-25.
- [73] (with A. Saha) The first  $p$ -jet space of an elliptic curve: global functions and lifts of Frobenius, *Math. Res. Letters*, Vol. 21, Number 04 (2014), 677-689.
- [74] Differential modular forms attached to newforms mod  $p$ , *J. Number Theory* 155 (2015), 111-128.
- [75] Transcendental numbers as solutions to arithmetic differential equations, *Bulletin Math. de la Soc. des Sciences Math. de Roumanie*, 58 (106) 3, (2015), 245-256. (Special number dedicated to V. Brinzanescu's 70th birthday).
- [76] Arithmetic analogues of some basic concepts from Riemannian geometry, *Revue Roumaine de Mathématiques Pures et Appliquées*, Vol. LX, 3, (2015), 257-266. (Special number dedicated to L. Badescu's 70th birthday).
- [77] (with Yu. I. Manin) Arithmetic differential equations of Painlevé VI type, in: *Arithmetic and Geometry*, London Mathematical Society Lecture Note Series: 420, L. Dieulefait, G. Faltings, D. R. Heath-Brown, Yu. V. Manin, B. Z. Moroz and J.-P. Wintenberger (eds), Cambridge University Press, 2015, pp. 114-138.
- [78] Differential calculus with integers, in: *Arithmetic and Geometry*, London Mathematical Society Lecture Note Series: 420, L. Dieulefait, G. Faltings, D. R. Heath-Brown, Yu. V. Manin, B. Z. Moroz and J.-P. Wintenberger (eds), Cambridge University Press, 2015, pp. 139-187.
- [79] (with T. Dupuy) Arithmetic differential equations on  $GL_n$ , I: differential cocycles, arXiv:1308.0748v1, *J.Algebra*, 454 (2016), 273291.
- [80] (with T. Dupuy) Arithmetic differential equations on  $GL_n$ , II: arithmetic Lie-Cartan theory, arXiv:1308.0744, *Selecta Math.* 22, 2, (2016), 447-528.

[81] (with T. Dupuy) Arithmetic differential equations on  $GL_n$ , III: Galois groups, arXiv:1308.0747, *Selecta Math.* 22, 2, (2016), 529-552.

[82] (with M. Barrett) Curvature on the integers, I, *Journal of Number Theory*, 167 (2016) pp. 481-508.

[83] Curvature on the integers, II, *Journal of Number Theory*, 167 (2016) pp. 509-545.

[84] (with E. Previato) Arithmetic Euler top, *J. Number Theory*, 173 (2017) pp. 37-63.

[85] (with E. Previato) The Euler top and canonical lifts, *J. Number Theory* 190 (2018), 156-168.

#### 4. PAPERS ACCEPTED

[86] Arithmetic Levi-Civita connection, *Selecta Math.*, (accepted 2019), arXiv:1708.02567.

#### 5. PAPERS SUBMITTED

[87] Arithmetic analogues of Hamiltonian systems, submitted to a volume dedicated to Emma Previato; Cambridge University Press, arXiv:1805.09630, 2018.

[88] Lie invariant Frobenius lifts and deformation of the Hasse polynomial, arXiv:-1805.09636, 2018, submitted to *Documenta Math.*

#### 6. OTHER PUBLICATIONS

[90] Serge Lang's early work on Diophantine and algebraic geometry, *Notices of the AMS* 54, 4 (2007), 479-484. (A survey article)