

CURRICULUM VALENTINA BEORCHIA

Dipartimento di Matematica, Informatica e Geoscienze,
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1. EMPLOYMENT

Associate Professor in Geometry at the Department of Mathematics, Computer Science and Geosciences, University of Trieste, since 15 March 2021.

2. EDUCATION

- (1) 15 July 1991: degree in Mathematics, University of Trieste, grade 110/110 cum laude, title of the thesis: *On the self-bound curves of \mathbb{P}^3* , supervisors prof. E. Mezzetti, prof. Ph. Ellia
- (2) 18 October 1993: Magister Philosophiae in Functional Analysis and Applications, Geometry sector, at the International School for Advanced Studies in Trieste, grade 30/30 with honours; title of the thesis: *Arithmetic genus of locally Cohen-Macaulay space curves*, supervisor prof. Ph. Ellia
- (3) 25 October 1994: Doctor Philosophiae (Ph. D.) in Functional Analysis and Applications, Geometry sector, at the International School of Advanced Studies in Trieste; title of the thesis: *Bounds for the maximal genus of space curves*, supervisor prof. Ph. Ellia

3. AWARDS

October 24, 1986: designation "Alfiere del Lavoro" for the year 1986 at the Palazzo della Civiltà del Lavoro in the presence of the President of the Republic.

4. PUBLICATIONS

4.1. Research articles.

- (1) Beorchia, V., Galuppi, F., Venturello, L. *Equations of Tensor Eigenschemes*, *Mathematics of Computation*, 2024, 93(346), pp. 589-602
- (2) Beorchia, V., Miró-Roig, R.M. *Jacobian Schemes of Conic-Line Arrangements and Eigenschemes*, *Mediterranean Journal of Mathematics*, 2024, 21(1), 16.
- (3) Beorchia, V., Galuppi, F. *Generic identifiability of pairs of ternary forms*, *Collectanea Mathematica*, 2023, 74(3), pp. 529-545.
- (4) Beorchia, V., Miró-Roig, R.M. *Configurations of eigenpoints*, *Journal of Pure and Applied Algebra*, 2023, 227(5).
- (5) V. Beorchia, F. Galuppi, L. Venturello: *Eigenschemes of ternary tensors*, *SIAM Journal on Applied Algebra and Geometry* (2021), pp. 620–650, doi: 10.1137/20M1355410
- (6) Beorchia, V.; Pirola, G. P.; Zucconi, F.: *Trigonal Deformations of Rank One and Jacobians*, *Int. Math. Res. Not. IMRN*, Volume 2021, Issue 12, Pages 8868-8884.
- (7) Beorchia, V., Zucconi, F.: *Generically nef vector bundles on ruled surfaces*, *Ann. Mat. Pura Appl.* (4) 198 (2019), no. 2, 443–463.
- (8) Beorchia, V., Lella, P., Schlesinger, E. *The Maximum Genus Problem for Locally Cohen-Macaulay Space Curves*, *Milan J. Math.* 86 (2018), no. 2, 137–155.
- (9) Beorchia, V.; Zucconi, F. *On the slope of fourgonal semistable fibrations*, *Math. Res. Lett.* 25(3) (2018), pp. 723-757.
- (10) Beorchia, V.; Sacchiero, G. *Weierstrass jump sequences and gonality*, *Semigroup Forum* 92 (2016), no. 3, 598-632.

- (11) Beorchia, V.; Zucconi, F. *A note on Harris Morrison sweeping families*, Collect. Math. 66 (2015), no. 2, 191-202.
- (12) Bellettini, G.; Beorchia, V.; Paolini, M. *Completeness of Reidemeister-type moves for surfaces embedded in three-dimensional space*, Atti Accad. Naz. Lincei Rend. Lincei Mat. Appl. 23 (2012), no. 1, 69-87.
- (13) Bellettini, G.; Beorchia, V. and Paolini, M. *Completion of visible contours*, SIAM J. Imaging Sci., 2 (2009), 777-833.
- (14) Beorchia, V.; Sacchiero, G. *Surfaces in \mathbb{P}^4 with a family of plane curves*. J. Pure Appl. Algebra 213 (2009), no. 9, 1750-1755.
- (15) Bellettini, G.; Beorchia, V.; Paolini, M. *An explicit formula for a Bennequin-type invariant of apparent contours*. Topology Appl. 156 (2009), no. 4, 747-760.
- (16) Bellettini, G.; Beorchia, V.; Paolini, M. *Topological and variational properties of a model for the reconstruction of three-dimensional transparent images with self-occlusions*. J. Math. Imaging Vision 32 (2008), no. 3, 265-291.
- (17) Beorchia, V.; Sacchiero, G. *One jump Weierstrass gap sequences*. Adv. Geom. 6 (2006), no. 1, 1-13.
- (18) Beorchia, V.; Ciliberto, C. and Di Gennaro V. : *Canonical map of low codimensional subvarieties*, J. Pure Appl. Algebra vol. 197, (2005), p. 183-212.
- (19) Beorchia, V.; Franco, D. : *On the moduli space of 't Hooft bundles*, Ann. Univ. Ferrara, sez. VII, Sc. Mat. Vol. XLVII, 253-268 (2001).
- (20) Beorchia, V.; Ellia, Ph.: *On the equations defining quasi complete intersection space curves*, Arch. Math. 70, No.3, 244-249 (1998).
- (21) Beorchia, V.: *Bounds for the genus of space curves*, Math. Nachr. 184, (1997), 59-71.
- (22) Beorchia, V.: *On the arithmetic genus of locally Cohen-Macaulay space curves*, Internat. J. Math. 6, n.4 (1995) p. 491-502.
- (23) Beorchia, V.; Ellia, Ph. *Normal bundle and complete intersections*. Commutative algebra and algebraic geometry, Rend. Sem. Mat. Univ. Politec. Torino 48 (1990), no. 4, 553-562 (1993).

4.2. Books.

- (1) Bellettini, G.; Beorchia, V.; Paolini, M.; Pasquarelli, F.: *Shape reconstruction from apparent contours. Theory and algorithms*. Computational Imaging and Vision, 44. Springer, Heidelberg, 2015. xxiv+365 pp. ISBN: 978-3-662-45190-8; 978-3-662-45191-5 94-02

5. RESEARCH PROJECTS DIRECTION

- (1) 2018 - 2021: Program coordinator: University of Trieste - University funding for scientific research projects - FRA 2018, project title: *Geometric, topological and computational aspects of manifolds*
- (2) 2020-2022: Direction of a two-year research grant for the project *Decomposition criteria for rank of Tensors and Applications*, within the Department of Excellence Project 2018 - 2023, Department of Mathematics and Geosciences of the University of Trieste; assignee Dr. Francesco Galuppi.

6. PARTICIPATION TO RESEARCH PROJECTS

- (1) 2002-2005: Ministerial National Program PRIN research program: *Techniques and problems of projective geometry*, National coordinator: A. Verra, local coordinator: Ph. Ellia;
- (2) 2004-2007: Participant in the Ministerial National Program PRIN research program *Classification and module problems in algebraic geometry*, Principal investigator A. VERRA, local coordinator B. FANTECHI;
- (3) 2007-2009: Ministerial National Program PRIN research program *Problems of classification and modules in algebraic geometry*, Principal investigator A. Verra, local coordinator B. Fantechi;
- (4) 2010-2012: Ministerial National Program PRIN research program *Classification problems and modules in algebraic geometry*, Scientific coordinator A. Verra, Scientific director U. Bruzzo;

- (5) 2011-2055: Ministerial National Program PRIN research program *Geometry of algebraic varieties*, national coordinator A. Verra, local coordinator E. Mezzetti;
- (6) University of Trieste - University funding for scientific research projects - FRA 2013, responsible M. Mecchia;
- (7) University of Trieste - University funds for scientific research projects - FRA 2015, responsible F. Perroni;
- (8) 2016-2019: Ministerial National Program PRIN research program *Geometry of algebraic varieties*, Principal Investigator A. Verra, local coordinator E. Mezzetti;
- (9) 2019 -2022: Ministerial National Program PRIN research program: *Modules Theory and Birational Classification*, Principal Investigator: L. Caporaso, local coordinator: U. Bruzzo;
- (10) 2023 -2025: Ministerial National Program PRIN research program: *GEOMETRY OF ALGEBRAIC STRUCTURES: MODULI, INVARIANTS, DEFORMATIONS* , Principal Investigator: U. Bruzzo.
- (11) Member of GNSAGA - INdAM.

7. INVITED TALKS

7.1. International Conferences.

- (1) *Genus of locally Cohen-Macaulay space curves* durante il convegno "Geometrie Algebrique en Liberte" presso il CIRM di Luminy (Marsiglia, Francia) dal 01-03-1993 al 05-03-1993
- (2) *Maximal arithmetic genus of locally Cohen-Macaulay space curves*, convegno Geometrie Algebrique en Liberte II presso il CIRM di Luminy (Marsiglia, Francia) dal 06-03-1994 al 11-03-1994
- (3) *G(d,s) for locally Cohen-Macaulay curves*, workshop Curve nello spazio, Europroj, Dipartimento di Matematica dell'Università di Ferrara dal 03-06-1994 al 06-06-1994
- (4) *A geometric approach to Weierstrass points*, durante il Meeting on Algebraic Varieties, incontro del progetto Ministerial National Program PRIN Geometria delle Varietà Algebriche ROMA 18-20 December 2003
- (5) *Some properties of curves having an assigned Weierstrass point*, durante il Workshop on Weierstrass points and related topics, Trieste 16-17 September 2004
- (6) *Splitting type of gonial scrolls*, durante il Joint Workshop TULS - Trieste, Udine, Ljubljana, Sissa, tenutosi presso la Sissa di Trieste, 26 maggio 2007
- (7) *The slope conjecture for fibrations in four-gonal curves*, TULSF VII Algebraic Geometry in Trieste - Udine - Ljubljana - SISSA - Ferrara, Trieste, 17.2.2012
- (8) *Bogomolov type inequalities for nef rank two vector bundles on ruled surfaces and slope of fibrations* , Workshop in algebraic geometry, Trieste, Dipartimento di Matematica e Geoscienze, 24 febbraio 2015.
- (9) *Discriminant of generically nef vector bundles on ruled surfaces*, TULSI Algebraic Geometry Meeting, Celebrating research in the Trieste-Ljubljana-Udine triangle, Sissa Trieste, 16 December 2017.
- (10) *Geometry of algebraic fibred surfaces with vector bundles techniques*, convegno Women of mathematics on the Mediterranean shores, Bled, Slovenia, 28 September 2019.
- (11) *Geometry of eigenschemes and of some Jacobian schemes*, A conference in honor of Philippe Ellia on the occasion of his retirement, February 12-14, 2024, University of Ferrara, Italy.
- (12) *Jacobian schemes and hessians of highly singular plane curves* , Winter Workshop on Algebraic Geometry, Math Department, University of Pavia, February 26-28, 2024.

7.2. Seminars.

- (1) *Uvod v projektivno geometrijo*, Oddelek za Matematiko, Univerza v Ljubljani, June 2009
- (2) *Klasifikacija projektivnih stožnic*, Oddelek za Matematiko, Univerza v Ljubljani, June 2011
- (3) *Stime sulle classi di Chern di fibrati vettoriali nef ed applicazioni*, Seminari di Algebra e Geometria, Dipartimento di Matematica "F. Casorati", Università degli Studi di Pavia, 3 December 2015.

8. ORGANIZATIONAL EXPERIENCE

- (1) *Recent trends in the geometry of moduli spaces of curves*, Trieste University - Sissa - Udine University, Workshop, with U. Bruzzo (SISSA Trieste) e F. Zucconi (Università di Udine), Sissa (Trieste), 13 e 14 June 2013
- (2) *Vector Bundles Days II*, Pau-Trieste Workshop on Vector Bundles and Related Topics, Trieste, 29 - 31 gennaio 2014
- (3) *Geometry Colloquium in Trieste*, with M. Mecchia e B. Zimmermann, Dipartimento di Matematica e Geoscienze - Trieste, 22 gennaio 2016
- (4) TAGSS (*Trieste Algebraic Geometry Summer School*) I: *Summer School in Enumerative Geometry*, with A. Boralevi e B. Fantechi, SISSA, 3 - 7 July 2017. Courses by M. Chiu-chiu Liu and C. Manolache.
- (5) *Una giornata form...attiva*, Conference for Mathematics and Science teachers of secondary schools, PLS - Mathematics project, organized together with F. Obersnel, University of Trieste, 29 September 2017.
- (6) TAGSS II – *Summer School: Geometry of Moduli Spaces of Curves*, with A. Boralevi (Politecnico di Torino), B. Fantechi (SISSA Trieste) and F. Villegas (ICTP Trieste), ICTP, Trieste, 18 - 22 June 2018. Courses by A. Gibney e O. Tommasi. <http://indico.ictp.it/event/8319/overview>
- (7) TAGSS III: *Algebraic Geometry towards Applications* (smr 3306) , with A. Boralevi (Politecnico di Torino), B. Fantechi (SISSA Trieste) and F. Villegas (ICTP Trieste), ICTP, Trieste, 1-5 July 2019. Courses by A. Dickenstein and S. Di Rocco. <http://indico.ictp.it/event/8695/>
- (8) *Una giornata form...attiva II*, Conference for Mathematics and Science teachers of secondary schools, PLS - Mathematics project, organized together with F. Obersnel, University of Trieste, 4 October 2019.
- (9) *Young Algebraic Geometry Meeting Trieste*, with E. Mezzetti and F. Perroni, Dipartimento di Matematica e Geoscienze - Trieste, 19 December 2019
- (10) 2021 TAGSS IV: *Summer School on Abelian Varieties, Prym Varieties and Related Topics* (smr 3609), A. Boralevi (Politecnico di Torino) and B. Fantechi (SISSA Trieste), ICTP Trieste, courses by E. Izadi and A. Ortega.
- (11) 2024 TAGSS V - *TROPICAL GEOMETRY AND RELATED TOPICS*, A. Boralevi (Politecnico di Torino) and B. Fantechi (SISSA Trieste), ICTP Trieste, courses by Margarida Melo and Marta Panizzut.

9. REFEREE ACTIVITY

- (1) referee for the journal *Bulletin of the Korean Mathematical Society*
- (2) referee for the journal *Rendiconti dell'Istituto di Matematica dell'Università di Trieste - An International Journal of Mathematics*

10. SUPERVISING EXPERIENCE

10.1. Bachelor degree.

- (1) V. Pegan: *Minimalne ploskve in Plateaujev problem - Superfici minime ed il problema di Plateau - Minimal surfaces and Plateau's problem*, joint degree program Univerzitetni diplomirani matematik / Laureato in Matematica, Ljubljana supervisor: prof. Pavle Saksida; 23 September 2010
- (2) E. E. Komlanvi: *Curve e superfici di Bèzier*, March 2012
- (3) D. Doz: *The hyperbolic plane, its models and its isometries*, tesi di laurea nell'ambito del programma di doppio titolo Univerzitetni diplomirani matematik / Laureato in Matematica, relatore dell'Università di Ljubljana: prof. Pavle Saksida; 23 September 2015
- (4) F. Costantini, *Un'introduzione alla geometria ellittica*, 25 October 2016
- (5) F. Coslovich, *Topologia delle Mappe Cinematiche e Robotica*, 15 March 2018
- (6) E. Peressi, *Proiezioni di superfici e problemi di ricostruzione*, 17 December 2018
- (7) A. Cremasco, *Geometria delle superfici minime*, 17 December 2018

10.2. Master degree.

- (1) Mirko Cappuccio, *Effective Methods for Algebraic Curves of Low Genus*; cosupervisor prof. Joseph Schicho, (RICAM), Austrian Academy of Sciences, Linz, Austria; 14 marzo 2016
- (2) D. Doz, *Il teorema di Alexander-Hirschowitz: Risultati fondamentali ed applicazioni alle varietà di Veronese-Segre*, 15 July 2017
- (3) M. Vidoni, *Aspetti algebrici e geometrici della Crittografia*, 15 March 2018
- (4) F. Costantini, *Geometria delle superfici di Del Pezzo*, 23 October 2018
- (5) M. Plazzotta, *Elliptic and Hyperelliptic Curve Geometry applied to Cryptography*, 24 September 2020

11. SERVICE

- (1) 2009: Participation in the drafting of the Double Degree Agreement in Mathematics with the University of Ljubljana, Slovenia;
- (2) dal 2009 - member of the joint commission for the Double Degree Program in Mathematics with the University of Ljubljana, Slovenia;
- (3) 2012 - 2015: member of the Didactical Commission of the Course of Studies in Mathematics
- (4) 2017: drafting of the agreement for the double master's degree program in Mathematics with the University of Ljubljana, Slovenia;
- (5) from 2019: member of the Department Board
- (6) 2020: member of the University Commission for the Evaluation of salary increases for teaching staff.