

# CURRICULUM VITÆ ET STUDIORUM

ANDREA CARANTI

Born 2 May 1952 in Rome, Italy  
Three children

## CURRENT POSITION

Full Professor of Algebra at the University of Trento since 9 April 1987

## ACADEMIC CAREER

Laurea in Matematica at Università degli Studi di Roma “La Sapienza”, 28 February 1975 (A. Machì)  
Borsa CNR laureando, Roma, 1974–1975 (Machì)  
Borsa CNR laureato, Padova, 1976 (G. Zacher)  
Servizio militare, Firenze e Padova, 1976–1977  
Borsa CNR laureato, Trento, 1977–1979 (Zacher)  
Assistant Professor of Algebra, Trento, 1979–1985  
Lecturer, Geometria II, Trento, 1979–1981  
Lecturer, Algebra, Trento, 1981–1985  
Borsa CNR-NATO, Würzburg (Germany), 1982 (H. Heineken)  
Associate Professor of Algebra, Trento, 1985–1987  
Visiting Fellow, Erlangen (Germany), Wintersemester 1985–1986  
Full Professor of Algebra, Trento, 1987–...  
Visiting Fellow, ANU Canberra, September 1996, CNR (Italy) mobility grant  
Visiting Fellow, ANU Canberra, December 1996 (CNR–GNSAGA)  
Visiting Fellow, ANU Canberra, December 1999 (INdAM–GNSAGA)

## ACADEMIC APPOINTMENTS

Dean of Undergraduate Studies, Trento, 1992–95  
Dean of Graduate Studies, Trento, 1997–2000  
Dean of Undergraduate Studies, Trento, 1998–2001  
Member of the Board of Opera Universitaria, Trento, 2001–2008  
Dean of Undergraduate Studies, Trento, 2008–2010  
Rector’s deputy for disabilities, Trento, 2010–2011  
Dean of the Faculty of Science, Trento, 2011–2012  
Member of the Senate, Trento, 2012–2013  
Member of Nucleo di Valutazione, Trento, 2013–2015  
Chair, Department of Mathematics, Trento, 2015–2018

UNIVERSITY COURSES GIVEN  
(MORE RECENT FIRST)

Group Theory, Trento, 2015–19  
 Algebra B, Trento, 2016/17, 2018/19  
 Advanced Group Theory, Trento, 2018/19  
 Mathematics for Data Science, Trento, 2018/19  
 Algebra A, Trento, 2015/16, 2017/18  
 Algebra, Trento, 2006–16  
 Algebra, Trento, 1999/2000 (U.D. 1), 2000/01 (U.D. 1, 2), 2001/02 (U.D. 2),  
 2002/03 (U.D. 1), 2003/04 (U.D. 2), 2004/05 (U.D. 1, 2), 2005/06 (U.D. 2)  
 Algebra, Trento, 1981–85, 1986/87, 1988/89, 1990/91, 1992–95, 1996/97  
 Geometria e Algebra Lineare, Trento, 2013/14  
 Finite Fields and Symmetric Cryptography, Trento, 2005–09  
 Galois Theory, Trento, 1985/86, 1987/88, 1989/90, 1991–93, 1994/95 (1° mod-  
 ulo), 1996–99 (1° modulo), 2002–06  
 Number Theory and Cryptography, Trento, 2000/01, 2004/05  
 Elementary Mathematics from an Advanced Standpoint, Trento, 2002–04  
 Introductory Mathematics for Economics, Trento, 1997–00, 2001/02  
 Geometria II, Trento, 1979–1981

ADVANCED COURSES GIVEN

Algebra (Group algebras), Istituto Nazionale di Alta Matematica, Roma, March-  
 May 1989  
 Analyticity and growth of pro-p groups, NATO Advanced Study Institute “Gen-  
 erators and Relations in Groups and Geometries”, Il Ciocco, April 1990  
 Computing in groups of prime-power order, Summer School on Computational  
 Group Theory, Politecnico, Budapest, August–September 1992  
 Algebra (Representation theory of algebras), Scuola Matematica Interuniversi-  
 taria, Perugia, August 1990  
 Algebra (Lie algebras), Scuola Matematica Interuniversitaria, Cortona, July/August  
 1996

ITALIAN PROJECTS

PRIN 1994, “Teoria dei gruppi ed algebra non commutativa”, local unit head  
 PRIN 1995, “Teoria dei gruppi, algebra non commutativa e logica matematica”,  
 local unit head  
 PRIN 1996, “Teoria dei gruppi, algebra non commutativa e teoria dei modelli”,  
 local unit head  
 PRIN 1999–2000, “Algebre di Lie graduate e pro-p-gruppi di ampiezza finita”,  
 head  
 PRIN 2001–2002, “Algebre di Lie graduate e pro-p-gruppi di ampiezza finita,  
 algebre loop, e derivazioni”, head  
 PRIN 2003–2005, “Algebre di Lie graduate e pro-p-gruppi: rappresentazioni,  
 periodicità e derivazioni”, head

PRIN 2006–2008, “Anelli e algebre di Lie. Gruppi. Crittografia”, local unit head

PRIN 2008 (2010–2012), “Algebre di Lie, gruppi, metodi computazionali, identità combinatorie, derivazioni”, local unit head

PRIN 2015 (2017–2020), “Group theory and applications”

Project “Dipartimenti di Eccellenza”, MIUR–Italy, proponent as Head of Department, 6 635 000 EUR

#### EUROPEAN PROJECTS

Tempus Project “Using Computer Algebra”, 1993–1996

Human Capital and Mobility Project “Computational Group Theory”, 1993–1996

#### INVITED TALKS

Linz (Austria), Gastvortrag, March 1985

Aachen (Germany), Gastvortrag, December 1985

Würzburg (Germany), Oberseminar, January 1986

Erlangen (Germany), Kolloquium, February 1986

Napoli, April 1986

Padova, November 1986

Genova, June 1987

Padova, February 1988

Bialystok (Poland), June 1988

Trieste, GNSAGA Workshop, October 1988

Lecce, May 1990

Padova, January 1991

$p$ -groups, Oberwolfach, 1992

Padova, November 1993

Milano, Seminario Matematico e Fisico, aprile 1994

Eindhoven (The Netherlands), October 1994

Aachen (Germany), Colloquium, January 1995

ANU Canberra, Colloquium, September 1996

Miniconference, ANU Canberra, September 1996

DAG-DAY, Eindhoven (The Netherlands), October 1996

Group Theory Workshop, Napoli, March 1997

London Mathematical Society Symposium on Pro- $p$ -groups and Related Topics, Durham, July 1997

One Hour Invited Talk, Groups St Andrews in Bath, July-August 1997

Firenze, Group Theory Workshop, February 1998

Freiburg, Colloquium, June 1998

EICMA, Milano, September 1998

SunCAGE '98, Caserta, November 1998

Padova, January 1999

Group Theory Workshop, Padova, February 1999

Minicourse at the Research Seminar on Groups, Combinatorics and Computer Science, Oulu, Finlandia, August 1999  
 Group Theory and Computation, Sydney, November 1999  
 Group Theory Workshop, Milano Bicocca, January 2000  
 Asymptotic Group Theory Conference, Jerusalem, May 2000  
 Group Theory Workshop, Lecce, December 2000  
 One Hour Invited Talk, Groups St Andrews in Oxford, July-August 2001  
 Accepted Poster, Coding and Cryptography, Milan Research centre for Industrial and Applied Mathematics (MIRIAM) Workshop, Milano, December 2003  
 Proseminar, Würzburg, November 2004  
 Workshop on Coding and Cryptography, Cork, May 2005  
 Incontro di Algebra Commutativa e Computazionale, Genova, November 2005  
 Science Festival, Genova, November 2006  
 Galway, January 2007  
 Group Theory Conference, Ischia, April 2008  
 Edinburgh Mathematical Society Meeting, St Andrews, 22 May 2009  
 Workshop on block ciphers and their security, Trento, 4 December 2009  
 Groups, Algebras and Algorithms, 18 March 2010, Eindhoven University of Technology  
 Universität Basel, 19 May 2010  
 Advances in Group Theory and Applications, Porto Cesareo, 7–10 June 2011  
 Bergwinter der Universität Innsbruck, Obergurgl, Austria, 16 April 2014  
 Scriver veloce. Sistemi tachigrafici dall'antichità a Twitter, Rovereto, 23 May 2014  
 UMI Conference, Siena, 2015  
 Gruppen und topologische Gruppen Wüzburg, Germany, 13–14 May 2016  
 Groups, Rings, and Their Automorphisms, a Conference in Honour of Evgeny Khukhro, Lincoln, UK, 31 August–2 September 2016  
 Ischia Group Theory 2018, 19–24 March 2018  
 First Joint Meeting of the Italian Mathematical Union, the Italian Society of Industrial and Applied Mathematics and the Polish Mathematical Society, Wrocław, Poland, 17–20 September 2018  
 The Asia-Australia Algebra Conference 2019, Sydney, 21–25 January 2019  
 Florence, 13 January 2019  
 XI Summer Workshop in Mathematics, Brasilia, 18–23 February 2019

#### OTHER TALKS

GNSAGA Workshop, L'Aquila, 1976  
 GNSAGA Workshop, Ferrara, 1978  
 GNSAGA Workshop, Modena, 1981  
 CIRM Workshop Trento, 1982  
 UMI Conference, Perugia 1983  
 Group Theory Workshop, Padova, 1984  
 GNSAGA Workshop, Torino 1984  
 Groups '85, St Andrews, 1985

Groups '89, St Andrews, 1989  
 Mal'cev Conference, Novosibirsk, 1989  
 CIRM Workshop Trento, 1993  
 Arbeitstagung "Gruppen und topologische Gruppen", Krems, Austria, June 1994  
 CIRM Workshop "Linear Groups", Levico, September 1995  
 GNSAGA Workshop "Computation in Algebra and Geometry", L'Aquila, October 1996  
 Group Theory Workshop, Udine, November 2003  
 Advances in Group Theory and Applications, Lecce, 5–8 September 2017

#### ORGANIZER OF CONFERENCES AND WORKSHOPS

Algebra Minicourse, Trento, 1980  
 Group Theory Workshop, Trento, 1984  
 Arbeitstagung "Gruppen und topologische Gruppen", Trento, June 1986  
 A short course in computational group theory, Trento, May 1988  
 Arbeitstagung "Gruppen und topologische Gruppen", Trento, June 1990  
 Profinite groups, INdAM, Cortona, September/October 1991  
 Nilpotent and Soluble Quotient Methods (with M.F. Newman), Trento, June 1998  
 Finitely-presented groups: questions and algorithms (with E.A. O'Brien, M.F. Newman), Trento, July 2001  
 Lie Algebras, their Classification and Applications (with Bettina Eick, Jörg Feldvoss, Marco Costantini), Braunschweig, May 2004  
 Lie Algebras, their Classification and Applications (with Bettina Eick, Willem de Graaf, Carlo Scoppola, Csaba Schneider) Trento, July 2005  
 The 11th Rhine Workshop on Computer Algebra, Levico Terme, June 2008  
 Group Theory in Trento, 7–8 June 2012  
 Gruppen und topologische Gruppen, Trento, 16–17 June 2017  
 UMI Conference, Pavia, 2019 Co-organiser, together with Carlo Scoppola, of the Algebra session

#### CONFERENCES AND WORKSHOPS ATTENDED

Group theory, CIRM, Trento, 1979  
 Arbeitstagung "Gruppen und topologische Gruppen", Innsbruck 1982, München 1982, Freiburg 1983, Erlangen 1983, München 1984, Freiburg 1985, Erlangen 1985, München 1986, Erlangen 1987, Erlangen 1989, Würzburg 1991, Freiburg 1992, München 1993, Würzburg 1995, Würzburg 1996  
 Combinatorial Geometry, La Mendola, 1983  
 Eurocal '85, Linz (Austria), April 1985  
 International Colloquium on Group Theory, Debrecen, 1985  
 Gruppentheorie, Oberwolfach, September 1985  
 International Conference in Group Theory, Brixen/Bressanone, 1986  
 CAMASA '86, Pavia, 1986  
 Computational Group Theory, Oberwolfach, May 1988

First International Symposium in Algebra and Number Theory, Hong Kong, August 1988

Groups - Korea 1988, Pusan, August 1988

International Conference in Group Theory, Brixen/Bressanone, June 1989

Algebra Workshop, Warwick, March 1991

Computational Group Theory, Oberwolfach, 1992

Groups '93, Galway, August 1993

Computational Group Theory, Oberwolfach, 1997

Computational Group Theory, Columbus, OH, June 1999

Group Theory Workshop, Brescia, October 2001

Group Theory Workshop, Salerno, October 2002

Computational Group Theory, Columbus, OH, March 2003

Group theory meeting, Padova, September 2008

Lie Methods in Group Theory, Trento, November 2008

Topics in Algebra, Milano Bicocca, 13–15 May 2009

Group Theory Conference, Ischia, April 2010

Group Theory Conference, Ischia, March 2012

Advances in Group Theory and Applications, Porto Cesareo, 10–14 June 2013

Group Theory Conference, Ischia, April 2014

Advances in Group Theory and Applications, Porto Cesareo, 16–19 June 2015

Francesco de Giovanni Day, Napoli, 8 October 2015

Mario Curzio Day, Napoli, 25 January 2016

Group Theory Conference, Ischia, 30 March– 2 April 2016

Group Theory in Florence: a Meeting in Honour of Guido Zappa, Florence, 16–17 June 2016

The 20th Midrasha Mathematicae — 60 Faces to Groups, Jerusalem, 6–11 November 2016

Group Theory in Florence II: a Meeting in Honour of Professor Guido Zappa, Florence, 5–7 September 2018

Una giornata per Silvia, Udine, 28 September 2018

#### SCHOOLS AND ADVANCED COURSES ATTENDED

Scuola Matematica Interuniversitaria, Perugia, 1975, 1976

Scuola Matematica Interuniversitaria, Cortona, 1977, 1978, 1979, 1980

CIME, Como, 1984

School of noncommutative algebra, Trento, September 1987

Group representation theory I, Trento, September 1987

Chevalley groups, Trento, September 1988

Group representation theory II, Trento, September 1990

School of noncommutative algebra, Parma, June 1991

Group representation theory III, Trento, September 1991

## GRADUATE STUDENTS

Norberto Gavioli (1994), Claretta Carrara (1997), Giuseppe Jurman (1998), Marina Avitabile (1999), Erika Damian (2003), Velitchko Todorov (2005), Silvia Rensi (2005), Simone Ugolini (2010)

## GENERAL TALKS

- Cappelli rossi, cappelli blu e codici a correzione d'errore
- Sette domande, una menzogna
- Pirati e monete d'oro (Bonus: occhi azzurri)

## LANGUAGES

Italian (mother language), English (fluent), German (Kleines Deutsches Sprachdiplom des Goethe-Instituts), some French

## ODDS (MORE RECENT FIRST)

On 25 July 2018 I have been interviewed by Radio3 Scienza, a daily magazine of Radio RAI, on prime numbers.

On February 27–28, 2013, I contributed to a stand on Cryptography and Error-Correcting Codes at the *Notte dei Ricercatori* in Trento

On 20 February 2012 my colleague Massimiliano Sala and I have been interviewed by Radio3 Scienza on a paper by Lenstra et al. on the security of the SSL protocol.

On 12 January 2012 I have been interviewed by Radio3 Scienza on the science of Sudoku.

*Lauree Scientifiche* project, 2006–...

Several talks at various schools

## ENDS

Member of Unione Matematica Italiana, American Mathematical Society, Accademia Roveretana degli Agiati

Member of Gruppo Nazionale per le Strutture Algebriche e Geometriche e loro Applicazioni (Istituto Nazionale di Alta Matematica)

Referee for various journals and institutions (CIVR — Italy, NSA — USA, FWF — Austria, NWO — The Netherlands, SNF — Switzerland)

Reviewer for Mathematical Reviews, Zentralblatt für Mathematik

## RESEARCH PAPERS

1. A. Caranti, *The multiple holomorphs of finite  $p$ -groups of class two*, J. Algebra **516** (2018), 352–372, arXiv:1801.10410.
2. A. Caranti and F. Dalla Volta, *Groups that have the same holomorph as a finite perfect group*, J. Algebra **507** (2018), 81–102, arXiv:1612.03573.
3. ———, *The multiple holomorph of a finitely generated abelian group*, J. Algebra **481** (2017), 327–347, arXiv:1611.05662.
4. R. Aragona, A. Caranti, and M. Sala, *The group generated by the round functions of a GOST-like cipher*, Ann. Mat. Pura Appl. (4) **196** (2017), no. 1, 1–17.

5. A. Caranti, *A simple construction for a class of  $p$ -groups with all of their automorphisms central*, Rend. Semin. Mat. Univ. Padova **135** (2016), 251–258. MR 3506071
6. A. Caranti and C. M. Scoppola, *Finite morphic  $p$ -groups*, J. Pure Appl. Algebra **219** (2015), 4635–4641.
7. A. Caranti, *Erratum to “A module-theoretic approach to abelian automorphism groups” [MR3314589]*, Israel J. Math. **215** (2016), no. 2, 1025–1026. MR 3552302
8. ———, *A module-theoretic approach to abelian automorphism groups*, Israel J. Math. **205** (2015), no. 1, 235–246. MR 3314589
9. R. Aragona, A. Caranti, F. Dalla Volta, and M. Sala, *On the group generated by the round functions of translation based ciphers over arbitrary finite fields*, Finite Fields Appl. **25C** (2014), 293–305.
10. A. Caranti, *Quasi-inverse endomorphisms*, J. Group Theory **16** (2013), no. 5, 779–792. MR 3101012
11. S. C. Featherstonhaugh, A. Caranti, and L. N. Childs, *Abelian Hopf Galois structures on prime-power Galois field extensions*, Trans. Amer. Math. Soc. **364** (2012), 3675–3684.
12. A. Caranti, Francesca Dalla Volta, and M. Sala, *On some block ciphers and imprimitive groups*, Appl. Algebra Engrg. Comm. Comput. **20** (2009), no. 5–6, 339–350.
13. ———, *An application of the O’Nan-Scott theorem to the group generated by the round functions of an AES-like cipher*, Des. Codes Cryptogr. **52** (2009), no. 3, 293–301, arXiv:0812.1629.
14. ———, *Abelian regular subgroups of the affine group and radical rings*, Publ. Math. Debrecen **69** (2006), no. 3, 297–308.
15. A. Caranti and S. Mattarei, *Automorphisms of  $p$ -groups of maximal class*, Rend. Sem. Mat. Univ. Padova **115** (2006), 189–198. MR MR2245595
16. A. Caranti and F. Dalla Volta, *The round functions of cryptosystem PGM generate the full symmetric group*, Des. Codes Cryptogr. **38** (2006), no. 1, 147–155.
17. A. Caranti and S. Mattarei, *Gradings of nongraded Hamiltonian Lie algebras*, J. Aust. Math. Soc. **79** (2005), no. 3, 1–42.
18. ———, *Nottingham Lie algebras with diamonds of finite type*, Internat. J. Algebra Comput. **14** (2004), no. 1, 35–67.
19. A. Caranti and M. R. Vaughan-Lee, *Graded Lie algebras of maximal class. V*, Israel J. Math. **133** (2003), 157–175.
20. ———, *Graded Lie algebras of maximal class. IV*, Ann. Scuola Norm. Sup. Pisa Cl. Sci. (4) **29** (2000), no. 2, 269–312. MR 2002c:17044
21. A. Caranti and M. F. Newman, *Graded Lie algebras of maximal class. II*, J. Algebra **229** (2000), no. 2, 750–784. MR 2001g:17041
22. A. Caranti and S. Mattarei, *Some thin Lie algebras related to Albert-Frank algebras and algebras of maximal class*, J. Austral. Math. Soc. (Series A) **67** (1999), 157–184.
23. A. Caranti and G. Jurman, *Quotients of maximal class of thin Lie algebras. The odd characteristic case*, Comm. Algebra **27** (1999), no. 12, 5741–5748.
24. A. Caranti, *Loop algebras of Zassenhaus algebras in characteristic three*, Israel J. Math. **110** (1999), 61–73.
25. A. Caranti, *Thin groups of prime-power order and thin Lie algebras: an addendum*, Quart. J. Math. Oxford (2) **49** (1998), 445–450.
26. A. Caranti, *Presenting the graded Lie algebra associated to the Nottingham group*, J. Algebra **198** (1997), no. 1, 266–289.
27. A. Caranti, S. Mattarei, and M. F. Newman, *Graded Lie algebras of maximal class*, Trans. Amer. Math. Soc. **349** (1997), no. 10, 4021–4051.
28. A. Caranti, S. Mattarei, M. F. Newman, and C. M. Scoppola, *Thin groups of prime-power order and thin Lie algebras*, Quart. J. Math. Oxford Ser. (2) **47** (1996), no. 187, 279–296.
29. A. Caranti, N. Gavioli, and S. Mattarei, *Subgroups of finite  $p$ -groups inducing the same permutation character*, Comm. Algebra **22** (1994), no. 3, 877–895.



30. R. Brandl, A. Caranti, and C. M. Scoppola, *Metabelian thin  $p$ -groups*, Quart. J. Math. Oxford Ser. (2) **43** (1992), no. 170, 157–173.
31. A. Caranti and C. M. Scoppola, *Endomorphisms of two-generated metabelian groups that induce the identity modulo the derived subgroup*, Arch. Math. (Basel) **56** (1991), no. 3, 218–227.
32. A. Caranti and C. M. Scoppola, *A remark on the orders of  $p$ -groups that are automorphism groups*, Boll. Un. Mat. Ital. A (7) **4** (1990), no. 2, 201–207.
33. C. Bagiński and A. Caranti, *The modular group algebras of  $p$ -groups of maximal class*, Canad. J. Math. **40** (1988), no. 6, 1422–1435.
34. A. Caranti, S. Franciosi, and F. de Giovanni, *Some examples of infinite groups in which each element commutes with its endomorphic images*, Group theory (Bressanone, 1986) (Berlin), Lecture Notes in Math., vol. 1281, Springer, Berlin, 1987, pp. 9–17.
35. A. Caranti, *Finite  $p$ -groups of exponent  $p^2$  in which each element commutes with its endomorphic images*, J. Algebra **97** (1985), no. 1, 1–13.
36. A. Caranti and C. M. Scoppola, *Central commutators*, Bull. Austral. Math. Soc. **30** (1984), no. 1, 67–71.
37. Andrea Caranti, *Automorphism groups of  $p$ -groups of class 2 and exponent  $p^2$ : a classification on 4 generators*, Ann. Mat. Pura Appl. (4) **134** (1983), 93–146.
38. Andrea Caranti, *On the automorphism groups of certain  $p$ -groups of class 4*, Boll. Un. Mat. Ital. B (6) **2** (1983), no. 2, 605–615.
39. Andrea Caranti and Pierantonio Legovini, *On finite groups whose endomorphic images are characteristic subgroups*, Arch. Math. (Basel) **38** (1982), no. 5, 388–390.
40. Andrea Caranti, *Gruppi finiti che soddisfano a una condizione sui normalizzanti*, Ricerche Mat. **29** (1980), no. 1, 3–16.
41. Andrea Caranti, *Proiettività dei  $p$ -gruppi di classe massimale*, Rend. Sem. Mat. Univ. Padova **61** (1979), 393–404 (1980).

#### OTHER PUBLICATIONS

1. A. Caranti and C. Giberti, *Tra brevitās e secretum, note sui linguaggi cifrati*, Scriver veloce. Sistemi tachigrafici dall'antichità a Twitter (Alessandro Tedesco, ed.), Accademia Roveretana degli Agiati, Leo S. Olschki, 2017, pp. 213–223.
2. A. Caranti, *Regular groups, radical rings, and abelian Hopf Galois structures on prime-power Galois field extensions*, Note Mat. **33** (2013), no. 1, 95–101. MR 3071313
3. ———, *Come stabilizzare un tavolo traballante, o il Teorema di Bolzano*, Manifesta 7: Index: Catalogo della mostra (Trentino, 19 luglio-2 novembre 2008) (Cinisello Balsamo (MI)) (A. Budak, A. Franke, and H. Peleg, eds.), Silvana Editoriale, 2008, p. 113.
4. ———, *Computing in groups of prime-power order*, Notes of a course given at the Summer School of Computer Algebra, Budapest Technical University, August–September 1992.
5. ———, *Analyticity and growth of pro- $p$ -groups*, Generators and relations in groups and geometries (Lucca, 1990) (Dordrecht), NATO Adv. Sci. Inst. Ser. C Math. Phys. Sci., vol. 333, Kluwer Acad. Publ., Dordrecht, 1991, pp. 321–341.
6. ———, *Alcune riflessioni sullo stato della divulgazione della Matematica in Italia*, Torricelliana (Bollettino della Società Torricelliana di Scienze e Lettere) **40** (1989), 93–106.

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