Thomas Seiller

Curriculum Vitae

LIPN – UMR CNRS 7030 Institut Galilée, Université Paris-Nord 99, av. Jean-Baptiste Clément 93430 Villetaneuse, France ⊠ seiller@lipn.fr " www.seiller.org



Positions

- 2018 **Research Scientist**, *CNRS*. Chargé de Recherche 1^{ère} classe (Research Tenured Position, Associate Professor level) Laboratory: Laboratoire d'Informatique de Paris Nord (LIPN), Paris 13 University.
- 2015–2018 **Post-Doctoral Researcher**, University of Copenhagen. Marie Curie Individual Fellowship (Horizon 2020)
- 2014–2015 Post-Doctoral Researcher, Paris 7 University.
- 2013–2014 **Post-Doctoral Researcher**, *IHÉS and IHP*. CARMIN post-doctoral fellowship
- 2012–2013 Post-Doctoral Researcher, INRIA.
- 2011–2012 Assistant Professor (Computer Science), Université de Savoie.
- 2008–2011 Research and Teaching Assistant (Mathematics), Université de la Méditerranée.

Grants/Awards

- 2020 **Two-years Scientific Project (20K\$)**, Thomas Jefferson Fund, FACE Foundation. Participants: Clément Aubert
- 2020 Scientific Project (67K€), DIM RFSI, Ile-de-France region. Participants: Maxime Lucas, Damiano Mazza, Samuel Mimram.
- 2020 International Collaboration Project (7K€), INS2I CNRS. For collaborations between LIPN and computer science departments of the University of Copenhagen and the University of Aarhus.
- 2019 Exploratory Project (7K€), PEPS Blanc 2019, INS2I CNRS.
- 2018 Young Investigator Project (7K€), JCJC 2018 call, INS2I CNRS.
- 2015 Marie Curie Individual Fellowship (212K€), Call H2020-MSCA-IF-2014.
- 2015 Best Paper Award, An intensionally fully-abstract sheaf model for π , CALCO 2015.
- 2013 **CARMIN postdoctoral fellowship**. Combined stay at the "Institut des Hautes Études Scientifiques" and the "Institut Henri Poincaré"
- 2008 PhD fellowship, from the French ministry for Higher Education and Research.
- 2007 "Bourse d'excellence", from the French ministry for Higher Education and Research.

Supervision

Postdoc Maxime Lucas, Sorbonne Paris Nord, September 2020 – August 2021.

- PhD Nguyễn Lê Thành Dũng, Paris 13 University, from September 2018.
- PhD Pierre-Yves Coursolles, École Polytechnique, from October 2018.
- PhD Sambo Boris Eng, Paris 13 University, from October 2019.

Master Nguyễn Lê Thành Dũng, ÉNS Paris, January – July 2018.
Master Sambo Boris Eng, Paris 7 University, March – August 2019.
Licence Seng Beng Goh, University of Cambridge, June – September 2018.
Licence Derek So, University of Cambridge, June – September 2019.
Licence Paul Séjourné, Sorbonne Université, February – June 2020.

Education

- PhD Mathematics, Aix-Marseille University.
- Master Mathematical Logic and Foundations of Computer Science, U. Paris 7.
- Maitrise **Philosophy**, Paris 1 University.
- Licence Mathematics, Strasbourg 1 University.

Publications (Peer Reviewed)

- Journal Interaction Graphs: Multiplicatives, Annals of Pure and Applied Logic 163 (2012), pp. 1808-1837, DOI: 10.1016/j.apal.2012.04.005.
- Journal Interaction Graphs: Additives, Annals of Pure and Applied Logic 167 (2016), pp. 95-154, DOI: 10.1016/j.apal.2015.10.001.
- Journal Characterizing co-NL by a Group Action, Mathematical Structures in Computer Science 26 (2016), pp. 606-663, with C. Aubert, DOI: 10.1017/S0960129514000267.
- Journal Logarithmic Space and Permutations, Information and Computation 248 (2016), pp. 2–21, with C. Aubert, DOI: 10.1016/j.ic.2014.01.018.
- Journal Interaction Graphs: Graphings, Annals of Pure and Applied Logic 168 (2017), pp. 278–320, DOI: 10.1016/j.apal.2016.10.007.
- Journal An intensionally fully-abstract sheaf model for π (extended version), Logical Methods in Computer Science 13 (2017), with C. Eberhart, T. Hirschowitz, DOI: 10.23638/LMCS-13(4:9)2017.
- Journal A Correspondence between Maximal Abelian Sub-Algebras and Linear Logic Fragments, Mathematical Structures in Computer Science 28 (2018), pp. 77–139, DOI: 10.1017/S0960129516000062.
- Journal Interaction Graphs: Nondeterministic Automata, ACM Transactions in Computational Logic 19 (2018), DOI: 10.1145/3226594.
- Journal Coherent Interaction Graphs: A Non-Deterministic Geometry of Interaction for MLL, EPTCS post-proceedings of Linearity-TLLA 2018, with L.T.D. Nguyễn, DOI: 10.4204/EPTCS.292.6.
- Journal Interaction Graphs: Exponentials, Logical Methods in Computer Science 15 (2019), 10.23638/LMCS-15(3:25)2019.
- Conference Logic Programming and Logarithmic Space, Lecture Notes in Computer Science Vol. 8858 (Proceedings of APLAS 2014), with C. Aubert, M. Bagnol, and P. Pistone, DOI: 10.1007/978-3-319-12736-1_3.
- Conference An intensionally fully-abstract sheaf model for π , 6th Conference on Algebra and Coalgebra in Computer Science (CALCO 2015), with C. Eberhart and T. Hirschowitz, DOI: 10.4230/LIPIcs.CALCO.2015.86.
- Conference Unary Resolution: Characterizing Ptime, 19th International Conference on Foundations of Software Science and Computation Structures (FoSSaCS 2016), with C. Aubert and M. Bagnol, DOI: 10.1007/978-3-662-49630-5_22.

- Conference Interaction Graphs: Full Linear Logic, ACM/IEEE Logic in Computer Science (LICS 2016), pp. 427-436, DOI: 10.1145/2933575.2934568.
- Conference Loop Quasi-Invariant Detection, International Symposium on Automated Technology for Verification and Analysis (ATVA 2017), with J.-Y. Moyen and T. Rubiano, DOI: 10.1007/978-3-319-68167-2_7.
 - Chapter On the Computational Meaning of Axioms, In O. Pombo, A. Nepomuceno, J. Redmond (Ed.) Epistemology, Knowledge and the Impact of Interaction (Springer), with A. Naibo and M. Petrolo, DOI: 10.1007/978-3-319-26506-3_5.
 - Chapter Verificationism and classical realizability, In C. Baskent (Ed.) Perspectives on Interrogative Models of Inquiry (Springer), with A. Naibo and M. Petrolo, DOI: 10.1007/978-3-319-20762-9_9.
- Workshop Loop Quasi-Invariant Chunk Motion by peeling with statement composition, In Proceedings DICE-FOPARA 2017, with J.-Y. Moyen and T. Rubiano, DOI: 10.4204/EPTCS.248.9.

Publications (Others)

- Recension **Recension de "The blind spot. Lectures on logic" par J.-Y. Girard (European** Mathematical Society, 2011), *Gazette des Mathématiciens 142, pp.136-143*, with C. Rétoré, hal-01076369.
- Proceedings Why Complexity Theorists Should Care About Philosophy, In Jean Fichot, Thomas Piecha (editors), Beyond Logic. Proceedings of the Conference held in Cerisyla-Salle, pp. 381–393., DOI: 10.15496/publikation-18676.

Peer Reviewed Communications without formal Proceedings

- 2013 Logarithmic Space and Permutations, DICE 2013.
- 2015 Measurable Preorders and Complexity, TACL 2015.
- 2016 Interaction Graphs and Quantitative Semantics, GaLoP 2016.
- 2018 A semantic conjecture on second-order MLL and its complexity consequences (work in progress), *Linearity-TLLA 2018*, with L.T.D. Nguyễn.
- 2018 Coherent Interaction Graphs: A Non-Deterministic Geometry of Interaction for MLL, *Linearity-TLLA 2018*, with L.T.D. Nguyễn.
- 2018 Entropy and Complexity Lower Bounds, DICE 2018, with Luc Pellissier.
- 2018 Entropy and Complexity Lower Bounds, Linearity-TLLA 2018, with Luc Pellissier.
- 2019 **PRAMs over integers do not compute maxflow efficiently**, *DICE-FOPARA* 2019, with L. Pellissier.
- 2019 Finite semantics of polymorphism, complexity and the power of type fixpoints, *DICE-FOPARA 2019*, with L.T.D. Nguyễn, P. Pistone and L. Tortora de Falco.

Tools/Software

- Software **A prototype LLVM pass**, implementing the loop optimisation described in the series of joint papers with J.-Y. Moyen and T. Rubiano. https://github.com/ThomasRuby/lqicm_pass
- Software A proof-of-concept in python for optimising C programs, implementing the loop optimisation described in the series of joint papers with J.-Y. Moyen and T. Rubiano. https://github.com/ThomasRuby/LQICM_On_C_Toy_Parser

Unpublished Documents (Available Online)

- 2007 La Ludique, (First Year) Masters Thesis (Philosophy).
- 2008 From Proof Nets to the Hyperfinite Factor, Masters Thesis (Mathematical Logic and Foundations of Computer Science).
- 2011 Topologie Non-Commutative. (Notes on Gelfand's theorem), Lecture Notes.
- 2011 Théorie des Ensembles (Set Theory), Lecture Notes.
- 2012 Logique dans le facteur hyperfini: géométrie de l'interaction et complexité, *PhD thesis.*
- 2012 Description of the Thesis: Logic in the Hyperfinite Factor: Geometry of Interaction and Complexity, 20-page english summary of my PhD thesis.
- 2014 Interaction Graphs and Complexity, Abstract.
- 2015 Memoization for Unary Logic Programming: Characterizing Ptime, Research report, Joint work with Marc Bagnol and Clément Aubert, January 2015.
- 2016 Notes on Graph C*-algebras and Dynamical Systems, Lecture Notes.
- 2018 Semantics, Entropy and Complexity Lower Bounds, with L. Pellissier.

Preprints

- Preprint Towards a Complexity-through-Realizability theory. https://arxiv.org/abs/1502.01257
- Preprint From Dynamic to Static Semantics, Quantitatively. https://arxiv.org/abs/1604.05047
- Preprint **PRAMs over integers do not compute maxflow efficiently**, with L. Pellissier. https://arxiv.org/abs/1811.06787
- Preprint Finite semantics of polymorphism, complexity and the power of type fixpoints, with L.T.D. Nguyễn, P. Pistone and L. Tortora de Falco. https://arxiv.org/abs/1902.00196v1
- Preprint Zeta functions and the (linear) logic of Markov Processes. https://hal.archives-ouvertes.fr/hal-02458330v1
- Preprint Probabilistic complexity classes through semantics. https://hal.archives-ouvertes.fr/hal-02458358v1
- Preprint Lower Bounds for PRAMs over Z, with L. Pellissier. https://hal.archives-ouvertes.fr/hal-02487667
- Preprint An Embellished Account of Agafonov's Proof of Agafonov's Theorem, with Jakob G. Simonsen. https://hal.archives-ouvertes.fr/hal-02891463
- Preprint Stellar Resolution: Multiplicatives, with Boris Eng. https://hal.archives-ouvertes.fr/hal-02895111
- Preprint Agafonov's Theorem for finite and infinite alphabets and probability distributions different from equidistribution, with Jakob G. Simonsen. https://hal.archives-ouvertes.fr/hal-02993635
- In Prep. Interaction Graphs: Pure Lambda-Calculi.
- In Prep. Logical Constants from a Computational Point of View, with A. Naibo, M. Petrolo.
- In Prep. A Probabilistic Agafonov's Theorem, with J. G. Simonsen.

Edititorial work

Editor Proceedings Third Joint Workshop on Developments in Implicit Computational complExity and Foundational & Practical Aspects of Resource Analysis, Electronic Proceedings in Theoretical Computer Science, DOI: 10.4204/EPTCS.298; ISSN: 2075-2180.

	Organizational Activities
	Organisational Activities
Organization	Organiser of the CALeidoscope 2021 Spring/Summer School on Computa- tional Complexity, Paris, France, 2021. https://caleidoscope21.sciencesconf.org.
Organization	Organiser of the LIPN-LAGA Operad day 2020 , <i>online</i> , November 5th 2020. https://operades20.sciencesconf.org.
Organization	Organiser of the CALeidoscope 2020 Spring/Summer School on Computa- tional Complexity, Paris, France, 2020. https://caleidoscope20.sciencesconf.org.
Organization	Organiser of the CALeidoscope 2019 Spring/Summer School on Computa- tional Complexity, Paris, France, 2019. https://caleidoscope.sciencesconf.org.
Organization	Workshop on Proof Nets and Transcendental Syntax, <i>GDRI Linear Logic</i> , Villetaneuse, France, 2018.
Organization	Logic group seminar and working groups, LIPN, Villetaneuse, from 2018, ongoing.
Organization	Seminar on semantics of linear logic, IT University, Copenhagen, 2015-2016.
Organization	Symposium "The meaning of Axioms", 14th CLMPS congress, 2011. Speakers: Denis Bonnay, Gilles Dowek, Alexandre Miquel, Alberto Naibo, Mattia Petrolo, Samuel Troncon
Organization	"Séances de Mathématiques" seminar, IML, Marseille, from 2010 to 2011.
Organization	Interdisciplinary Working Group for PhD Students, Reunions in Paris and Marseille, in 2010 and 2011. Funded by: Paris 1 University, Paris 7 University, Aix Marseille, II University, ENS (Paris)
Organization	Working Group on Geometry of Interaction, Reunions in Paris and Marseille, from 2008 to the creation of the ANR project LOGOI.
	Invited Doctoral Courses and Seminars
Course	Paris 1 University, June 2009, 15 hours course, Paris, France.
Course	Thematic School "Linear Logic, Ludics and Geometry of Interaction" , August 27th – September 1st, 2012, 1h30 course, Paraty, Brazil.
Course	Summer School on Linear Logic and Geometry of Interaction, August 27th- 31st, 2013, 1h30 course, Turin, Italy.
Course	Oberseminar "Logik und Sprachtheorie" , October 29th, 2013, 4 hours course, Tubingen, Germany.
Seminar	Semantics of Linear Logic, From November 2015 to May 2016, IT University, Copenhagen, Denmark.
	Invited Communications in International Events
Talk	Summer School on Linear Logic and Geometry of Interaction August 31st

TalkSummer School on Linear Logic and Geometry of Interaction, August 31st,
2013, Turin, Italy.

- Talk Workshop "Higher Order Computation: Types, Complexity, Applications", June 16th, 2014, Institut Henri Poincaré, Paris, France.
- Talk Workshop "Quantitative Semantics of Logic and Computation", September 2nd, 2016, Marseille, France.
- Talk Conference of the ANR-DFG project BeyondLogic, May 22nd-26th, 2017, Cerisy, France.
- Talk Linear Logic, Thirty Years Later, October 25th, 2017, Rome, Italy.
- Talk Logical Time and Computational Time, November 13th-14th, 2017, Lyon, France.
- Talk Cologne-Twente workshop on Graphs and Combinatorial Optimization, June 18th-20th 2018, CNAM, Paris, France.
- Talk Joint invited talk for the Structures and Deduction (SD 2019) and Trends in Linear Logic (TLLA 2019) international workshops, June 29-30th, 2019, Dortmund, Germany.
- Talk Logic and Computational Complexity workshop (LCC 2019), July 8th, 2019, Patras, Greece.
- Talk Shonan Meeting on Higher Order Complexity and Applications, October 7– 10th, 2019, Shonan Village, Japan.

• Administrative Roles

- 2020 Member of the Communication committee of the EUR Project Math & Computer Science graduate school. https://eur.univ-paris13.fr/fr
- 2019 Head of the Communication committee at LIPN (correspondant communication du laboratoire).
- 2018 Member of the International Relations committee at LIPN.
- 2018 Person in charge of Communication and Web for the LoVe team at LIPN. Member of the Communication committee at LIPN.

Other Research Activities

- Visits Research Visits, Datalogisk Institut, University of Copenhagen (08/2014, 10/2017, 11/2017, 01/2018, 03/2018, 10/2019), PUC-Rio, Brazil (08/2018), ERATO MMSD, National Institute of Informatics, Japan (10/2019), RIMS, Kyoto University (10/2019).
- Evaluator Expert-Evaluator for the European Union, 2020.
- PC Chair and Organiser of DICE-FOPARA 2019, ETAPS 2019 affiliated event, Prague, Czech Republic, 2019.
 Joint workshop: 10th workshop on Developments in Implicit Computational Complexity, and 6th workshop on Foundational and Practical Aspects of Resource Analysis.
- PC Member of the Program Committee for LCC (Logic and Computational Complexity) 2020.
- PC Member Member of the Program Committee for Linearity-TLLA (joint workshop: 6th international workshop on Linearity and 4th international workshop on Trends in Linear Logic and Applications) 2020.
- PC Member Member of the Program Committee for GaLoP (Games for Logic and Programming Languages) 2019.
- PC Member of the Program Committee for DICE (Developments in Implicit Computational Complexity) 2016.

Peer-Review	Referee for international journals.
	Information and Computation, Mathematical Structures in Computer Science, Logical Methods in Computer Science, ACM Transactions in Computational Logic
Peer-Review	Referee for international conferences . CSL 2013, RTA/TLCA 2014, ACM/IEEE LICS 2015, 2016, FoSSaCS 2017, CALCO 2017
Reviewer	Reviewer for Mathematical Reviews (American Mathematical Society).
Reviewer	Beviewer for Zentralblatt MATH (zbMATH)
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	Selection of other Invited Communications
Talk	ANR project LOGOI meeting, June 14th, 2012, Marseille, France.
Talk	ANR project RECRE meeting, October 11th, 2012, Lyon, France.
Talk	"PPS Seminar", January 24th, 2013, PPS, Paris, France.
Talk	ANR project LOGOI meeting, February 1st, 2013, Marseille, France.
Talk	"LAMA Seminar", April 4th, 2013, LAMA, Chambéry, France.
Talk	ANR project LOGOI meeting, June 10th-11st, 2013, Paris, France.
Talk	"68nqrt" Seminar, June 13th, 2013, IRISA/INRIA, Rennes, France.
Talk	GdR IM meeting, January 28th, 2014, Paris, France.
Talk	Séminaire de Mathématiques, February 25th, 2014, IHÉS, Bures-sur-Yvette, France.
Talk	"Algorithmics, Complexity and Logic Laboratory" seminar, March 31st, 2014, LACL, Paris, France.
Talk	ANR project ELICA meeting, February 6th, 2015, LIPN, Paris, France.
Talk	ANR project LOGOI meeting, March 24th, 2015, IML, Marseille, France.
Talk	HCC seminar, November 27, 2015, Department of Computer Science (DIKU), University of Copenhagen, Denmark.
Talk	"PPS Seminar", March 10th, 2016, PPS, Paris, France.
Talk	CHOCOLA Seminar, November 9th, 2017, ENS Lyon, France.
Talk	Workshop on Realisability, June 12th-13th 2018, CIRM, Marseille, France.
Talk	Computer Science Department seminar, August 7th, 2018, PUC-Rio, Rio de Janeiro, Brazil.
Talk	Colloque "Le même et l'autre : identité, orthogonalité, types" , November 5-6th 2018 Lyon France
Talk	Séminaire Général de Logique, March 18th, 2019, IMJ-PRG, Paris, France.
	Selection of Communications (Workshops and Conferences)
Talk	"Interaction Graphs: Multiplicatives", GaLoP V (Games for Logic and Program- ming Languages), ETAPS 2010 Workshop, March 20th-21st, 2010, Paphos, Cyprus.
Talk	"Logical Constants from a Computational Point of View", ANR project LOCI meeting, January 20th-21st, 2011, CIRM, Marseille, France.
Talk	"Interaction Graphs: Additives", Workshop on Linear Logic (Geometry of Interac- tion, Traced Monoidal Categories and Implicit Complexity), November 7th-11th, 2011, Kyoto, Japan.
Talk	"Interaction Graphs: Additives", Logic and Interaction 2012, January 30th – March 2nd, 2012, CIRM, Marseille, France.
Talk	"Interaction Graphs: Additives", LICS 2012 (Logic In Computer Science), June 25th-28th, 2012, Dubrovnik, Croatia.

- Talk "Interaction Graphs: Additives", GaLoP VII (Games for Logic and Programming languages), June 29th, 2012, Dubrovnik, Croatia.
- Talk **"Espace Logarithmique et Permutations"**, *GEOCAL Meeting*, February 15th, 2013, Lyon, France.
- Talk "Logarithmic Space and Permutations", DICE 2013 (Developments in Implicit Computational Complexity), March 17th, 2013, Rome, Italy.
- Talk **"Interaction Graphs and Complexity"**, *GEOCAL Meeting*, March 25th, 2014, Bordeaux, France.
- Talk **"Towards a Complexity-through-Realizability Theory"**, FOPARA–DICE 2015, April 12th, 2015, London, UK.
- Talk "Measurable Preorders and Complexity", TACL 2015 (Topology, Algebra and Categories in Logic, June 26th, 2015, Ischia, Italy.
- Talk "Interaction Graphs and Quantitative Semantics", GALOP 2016 (Games for Logic and Programming Languages), ETAPS 2016 Workshop, April 2nd, 2016, Eindhoven, Netherlands.
- Talk "Measurable Preorders and Complexity", FOSSACS 2016 (Foundations of Software Science and Computation Structures), April 6th, 2016, Eindhoven, Netherlands.
- Talk "Interaction Graphs: Full Linear Logic", LICS 2016 (IEEE/ACM Logic in Computer Science), July 6th, 2016, New York, USA.
- Talk "Computational Complexity, between Algebra and Geometry", GEOCAL-LAC Meeting, November 29th, 2016, Paris, France.
- Talk "Entropy and Complexity Lower Bounds", Developments in Implicit Computational Complexity (DICE) 2018, April 14th-15th, 2018, Thessaloniki, Greece.
- Talk "Measurable Dynamics, Logic and Computational Complexity", Conference on Mathematical Logic, Satellite event of the ICM 2018, August 10th-11th, 2018, Niterói, Brazil.
- Talk **"PRAMs over integers do not compute maxflow efficiently"**, *Joint international workshop on Developments in Implicit Computational Complexity and Foundations and Practice of Resource Analysis (DICE-FOPARA) 2019*, April 6-7th, 2019, Prague, Czech Republic.

Teaching Experience

- 2019-2020 **Exercise Sessions in Computer Science**, Université de Nantes, 22 hours. Courses: Fundamentals of Computer Science (third year students, computer science diploma, second semester).
- 2018-2019 Lectures in Mathematics / Computer Science, Université Paris 13, 54 hours. Courses: Category Theory (third year students, dual mathematics and computer science diploma, first semester).
- 2017-2018 Lectures in Mathematics / Computer Science, Université Paris 13, 48 hours. Courses: Category Theory (third year students, dual mathematics and computer science diploma, first semester).
- 2017-2018 Exercise Sessions and Practice Sessions in Computer Science (languages: C), Université Paris 13, 60 hours. Courses: Logic, Algorithmics (first year students, second semester).
- 2012-2013 Exercise Sessions and Practice Sessions in Computer Science (languages: Python), Université de Savoie, 40 hours. Courses: Algorithmic and Programming (first year students, second semester).

- 2011-2012 Exercise Sessions and Practice Sessions in Computer Science (languages: Python, Ada and C), Université de Savoie, 176 hours.
 Courses: Introduction to Algorithmic and Programming (first year students, first semester), Algorithmic and Programming (first year students, second semester), Imperative Programming (second year students, first semester), Operating Systems (third year students, first semester).
- 2008-2011 Lectures in Mathematics (third year students), Université de la Méditerranée. Courses: Introduction to Logic. (36 hours of teaching each year)

Other Teaching Activities

- 2015 **Participation to the "Fête de la science" in Paris**. This is a national yearly event for the popularisation and promotion of science, organised by the French ministry for higher education and research.
- 2013 Qualified for holding a *Maitre de Conférence* position both in mathematics and in computer science, *Delivered by the French ministry of higher education and research*, 13/02/2013, Qualification Number: 13225242836.
- 2012-2013 **Co-organization of a "Maths à modeler" course**, Université de Savoie. This is an initiation to research course for elementary school pupils (around ten 1h30 sessions).
- 2008-2011 **Participation to five "Hippocampe" courses**, Université de la Méditerranée. These are three-days courses initiating high-school and middle-school students to research.

Carrier Breaks

21 Weeks Paternity Leave (2 weeks) from May 6th 2016 to May 23rd 2016, and Parental Leave (19 weeks) from October 24th, 2016 to March 5th, 2017.