# Jan Volec – Curriculum Vitae

Czech Technical University in Prague

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Department of Mathematics, Faculty of Nuclear Sci. and Physical Eng.

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#### Working experience

Assistant professor at Czech Technical University in Prague since Feb 2020
Postdoctoral researcher at Masaryk University, Faculty of Informatics Aug 2019–Nov 2019
Marie Sklodowska-Curie Actions fellow at Emory University and Universität Hamburg Oct 2018–Mar 2019
CRM-ISM fellow at McGill University, Montréal Sep 2016–Aug 2018
Postdoctoral researcher at ETH Zürich Sep 2014–Aug 2016

#### Education

University of Warwick, PhD in Mathematics (transferred from Charles University in 2012)

Jan 2013–Sep 2014

jointly (cotutelle) with Université Paris Diderot (Paris 7), PhD in Computer Science

defended Dec 2014

Charles University in Prague, Faculty of Mathematics and Physics Oct 2006–Dec 2012
Participant of DIMACS-DIMATIA REU program, Rutgers University, NJ Summer 2008, 2009, 2011

#### Research awards and funding

Czech Science Foundation (GAČR), JuniorStar grant, 17.747.000 CZK (equiv. \$785.976)

Horizon 2020 MSCA Global Fellowship, 240.000 EUR (equiv. \$271.000)

Oct 2018–Sep 2021

suspended for medical reasons in Apr 2019

CRM-ISM Postdoctoral Fellowship, C\$82.000 (equiv. \$62.500)

Warwick Faculty of Science Doctoral Thesis Award

Campus France – scholarship for joint PhD studies in France, 7.700 EUR (equiv. \$10.500)

Apr 2012–Aug 2014

Charles University Student Grant (GAUK), 241.000 CZK (equiv. \$12.700)

Apr 2012–Dec 2012

## Student supervision

Adrian Binding – Master thesis, ETH Zürich (co-supervised with Benny Sudakov) defended Aug 2016

Martin Nägele – Bachelor thesis, ETH Zürich (co-supervised with Benny Sudakov) defended Jul 2015

#### Teaching experience – Research schools and lecture series

Flag Algebras Summer School 2023

Randomized Algorithms, ATHENS (Advanced Technology Higher Edu. Network)

Lecture series on Flag Algebras and the Semidefinite method

Lecture series on Flag Algebras and the Semidefinite method

School of Advanced Science on Algorithms, Combinatorics and Optimization – exercises

Research School on Regularity and Analytic Methods in Combinatorics – exercises

IA State University, May 2023

Czech Technical University, Nov 2021

LORIA Nancy, Feb–Mar 2014

Emory University of São Paulo, Jul 2016

University of Warwick, Jul 2015

## Teaching experience – lectures

Linear Programming Czech Technical University, Fall 2023 **Graph Theory** Czech Technical University, Fall 2022-2023 Game Theory Czech Technical University, Spring 2021-2023 Theory of Codes Czech Technical University, Spring 2021-2023 Complexity Theory Czech Technical University, Fall 2020-2022 Flag Algebras & Graph Limits Seminar Emory University, Spring 2019 **Graph Theory and Combinatorics** McGill University, Fall 2016 and 2017 Graph Limits Graduate Seminar ETH Zürich, Spring 2015

#### Teaching experience – tutorials

Teaching assistant for Calculus 2 Czech Technical University, Spring 2022 Teaching assistant for Calculus A4 Czech Technical University, Spring 2021 Teaching assistant for Calculus 1 Czech Technical University, Fall 2020 and 2021 Teaching assistant for Expander Graphs and Their Applications ETH Zürich, Spring 2016 Teaching assistant for Algebra I ETH Zürich, Fall 2015 Teaching assistant for Topics of Mathematics in Computer Science ETH Zürich, Fall 2014 Teaching assistant for Discrete Mathematics and its Applications 1 University of Warwick, Fall 2013 Teaching assistant for Combinatorics and Graph Theory III Charles University, Fall 2011 Teaching assistant for Combinatorics and Graph Theory II Charles University, Fall 2011 Teaching assistant for Combinatorics and Graph Theory I Charles University, Spring 2009 and 2010 Teaching assistant for Discrete Mathematics Charles University, Fall 2008 and 2009

#### Professional service

A. Svoboda Award for the best PhD thesis committee member, Czech Society for Cybernetics & Informatics

Competition for university students in mathematical research (SVOČ) evaluator, Czech Mathematical Society

A Sparse (Graphs) Coallition member

Since Dec 2020

Computer science board of the Charles University Grant Agency panel member

Extremal and probabilistic combinatorics webinar co-organizer

Apr 2020–Dec 2021

#### Journal publications

- 1. J. Balogh, F. C. Clemen, B. Lidický, S. Norin, J. Volec: *The Spectrum of Triangle-Free Graphs*, SIAM J. Discrete Math. 37 (2023), 1173–1179.
- 2. A. Grzesik, J. Volec: Degree conditions forcing directed cycles, Int. Math. Res. Not. 2023 (2023), 9711—9753.
- 3. V. Falgas-Ravry, O. Pikhurko, E. Vaughan, J. Volec: *The codegree threshold of*  $K_4^-$ , J. Lond. Math. Soc. 107 (2023), 1660–1691.
- 4. R. Hancock, A. Kabela, D. Kráľ, T. Martins, R. Parente, F. Skerman, J. Volec: *No additional tournaments are quasirandom-forcing*, European J. Combin. 108 (2023), article no. 103632, 10pp.
- 5. R. Hancock, D. Kráľ, M. Krnc, J. Volec: *Towards characterizing locally common graphs*, Random Structures Algorithms 62 (2023), 181–218.
- 6. A. Grzesik, D. Kráľ, L. M. Lovász, J. Volec: *Cycles of a given length in tournaments*, J. Combin. Theory Ser. B. 158 (2023), 117–145.
- 7. A. Grzesik, J. Lee, B. Lidický, J. Volec: On tripartite common graphs, Combin. Probab. Comput. 31 (2022), 907–923.
- 8. A. Blumenthal, B. Lidický, R. Martin, S. Norin, F. Pfender, J. Volec: *Counterexamples to a conjecture of Harris on Hall ratio*, SIAM J. Discrete Math. 36 (2022), 1678–1686.

- 9. D. Kráľ, J. A. Noel, S. Norin, J. Volec, F. Wei: Non-bipartite k-common graphs, Combinatorica 42 (2022), 87–114.
- 10. A. Blumenthal, B. Lidický, O. Pikhurko, Y. Pehova, F. Pfender, J. Volec: *Sharp bounds for decomposing graphs into edges and triangles*, Combin. Probab. Comput. 30 (2021), 271–287.
- 11. T. Chan, D. Král', J. A. Noel, Y. Pehova, M. Sharifzadeh, J. Volec: *Characterization of quasirandom permutations by a pattern sum*, Random Structures Algorithms 57 (2020), 920–939.
- 12. R. Glebov, D. Král', J. Volec: Compactness and finite forcibility of graphons, J. Eur. Math. Soc. 21 (2019), 3199–3223.
- 13. A. Grzesik, P. Hu, J. Volec: Minimum number of edges that occur in odd cycles, J. Combin. Theory Ser. B 137 (2019), 65–103.
- 14. D. Kráľ, S. Norin, J. Volec: A bound on the inducibility of cycles, J. Combin. Theory Ser. A. 161 (2019), 359–363.
- 15. J. Balogh, P. Hu, B. Lidický, F. Pfender, J. Volec, M. Young: *Rainbow triangles in three-colored graphs*, J. Combin. Theory Ser. B 126 (2017), 83–113.
- 16. N. Kamčev, B. Sudakov, J. Volec: *Bounded colorings of multipartite graphs and hypergraphs*, European J. Combin. 66 (2017), 235–249.
- 17. B. Sudakov, J. Volec: *Properly colored and rainbow copies of graphs with few cherries*, J. Combin. Theory Ser. B 122 (2017), 391–416.
- 18. J.-S. Sereni, J. Volec: A note on acyclic vertex-colorings, J. Comb. 7 (2016), 725–737.
- 19. R. Glebov, D. Kráľ, J. Volec: A problem of Erdős and Sós on 3-graphs, Israel J. Math. 211 (2016), 349–366.
- 20. Z. Dvořák, J.-S. Sereni, J. Volec: Fractional coloring of triangle-free planar graphs, Electron. J. Combin. 22 (2015), #P4.11.
- 21. J. Balogh, P. Hu, B. Lidický, O. Pikhurko, B. Udvari, J. Volec: *Minimum number of monotone subsequences of length 4 in permutations*, Combin. Probab. Comput. 24 (2015), 658–679.
- 22. J. van den Heuvel, D. Kráľ, M. Kupec, J.-S. Sereni, J. Volec: *Extensions of Fractional Precolorings show Discontinuous Behavior*, J. Graph Theory 77 (2014), 299–329.
- 23. Z. Dvořák, J.-S. Sereni, J. Volec: *Subcubic triangle-free graphs have fractional chromatic number at most* 14/5, J. Lond. Math. Soc. 89 (2014), 641–662.
- 24. F. Kardoš, D. Kráľ, J. Volec: *Maximum edge-cuts in cubic graphs with large girth and in random cubic graphs*, Random Structures Algorithms 41 (2012), 506–520.
- 25. D. Kráľ, M. Krnc, M. Kupec, B. Lužar, J. Volec: Extending fractional precolorings, SIAM J. Discrete Math. 26 (2012), 647–660.
- 26. D. Kráľ, P. Škoda, J. Volec: Domination number of cubic graphs with large girth, J. Graph Theory 69 (2012), 131–142.
- 27. F. Kardoš, D. Kráľ, J. Volec: Fractional colorings of cubic graphs with large girth, SIAM J. Discrete Math. 25 (2011), 1454–1476.

#### Submitted papers and preprints

- 1. M. Trödler, J. Volec, J. Vybíral: A tight lower bound on the minimal dispersion, available as arxiv:2311.10666.
- 2. D. Kráľ, J. Volec, F. Wei: Common graphs with arbitrary chromatic number, available as arxiv:2206.05800.
- 3. X. Goaoc, A. Hubard, R. de Joannis de Verclos, J.-S. Sereni, J. Volec: Limits of order types, available as arxiv:1811.02236.

## Contributions at conferences with published proceedings

- 1. P. Hu, B. Lidický, T. Martins, S. Norin, J. Volec: *Large Multipartite Subgraphs in H-free Graphs*, Trends in Mathematics 14 (2021), 707–713.
- 2. A. Blumenthal, B. Lidický, O. Pikhurko, Y. Pehova, F. Pfender, J. Volec: *Sharp bounds for decomposing graphs into edges and triangles*, Acta Mathematica Universitatis Comenianae 88 (2019), 463–468.
- 3. R. Glebov, A. Grzesik, J. Volec: *Degree conditions forcing oriented cycles*, Acta Mathematica Universitatis Comenianae 88 (2019), 729–733.
- 4. V. Falgas-Ravry, O. Pikhurko, E. Vaughan, J. Volec: *The codegree threshold of*  $K_4^-$ , Electronic Notes in Discrete Mathematics 61C (2017), 407–413.
- 5. X. Goaoc, A. Hubard, R. de Joannis de Verclos, J.-S. Sereni, J. Volec: *Limits of order types*, 31<sup>st</sup> International Symposium on Computational Geometry, Leibniz International Proceedings in Informatics 34 (2015), 300–314.
- 6. B. Sudakov, J. Volec: *Properly colored and rainbow copies of graphs with few cherries*, Electronic Notes in Discrete Mathematics 49 (2015), 315–321.
- 7. R. Glebov, D. Kráľ, J. Volec: A problem of Erdős and Sós on 3-graphs, CRM Series 16 (2013), 3-8.

- 8. Z. Dvořák, J.-S. Sereni, J. Volec: Subcubic triangle-free graphs have fractional chromatic number at most 14/5, CRM Series 16 (2013), 497–502.
- 9. R. Glebov, D. Kráľ, J. Volec: *An application of flag algebras to a problem of Erdős and Sós*, Electronic Notes in Discrete Mathematics 43 (2013), 171–177.
- 10. O. Bílka, J. Jirásek, P. Klavík, M. Tancer, J. Volec: *On the Complexity of Planar Covering of Small Graphs*, 37<sup>th</sup> Workshop on Graph-Theoretic Concepts in Computer Science, Lecture Notes in Computer Science 6986 (2011), 83–94.

# Presentations at conferences and workshops

31 <sup>st</sup> Workshop Cycles and Colourings, Nový Smokovec * Invited lecture "Common graphs with arbitrary chromatic number"	2023
Foundations of Computational Mathematics, Paris  * presentation invited by the "Graph Theory and Combinatorics" workshop organizers	2023
Graph Limits, Non-Parametric Models, and Estimation Workshop, Simons Institute, Berkeley CA ** Invited lecture "Common graphs with arbitrary chromatic number"	2022
Graphs, Groups, Stochastic Processes, Erdős Center Budapest * Invited lecture "On the minimum eigenvalue of regular triangle-free graphs"	2022
Graph Theory Workshop, Mathematisches Forschungsinstitut Oberwolfach (hybrid)  ** Invited lecture "Common graphs with arbitrary chromatic number"	2022
Young Researchers in Extremal and Probabilistic Combinatorics, IBS Daejeon, Korea (online)  ** Invited lecture "Existence of common graphs with large chromatic number"	2021
School on Theoretical Informatics, Graphs and Mathematical Applications (STIGMA), Jílemnice	2021
11 <sup>th</sup> European Conference on Combinatorics, Graph Theory and Applications (Eurocomb '21), Barcelona (online)	2021
Současné Tredny Teoretické Informatiky (STTI), Prague	2021
55 <sup>th</sup> Czech-Slovak Conference on Graph Theory, Brno * Invited lecture "On degree thresholds of cycles in oriented graphs"	2020
25 <sup>th</sup> Midsummer Combinatorial Workshop (MCW), Prague	2020
Structure, Sparsity and Randomness, Nijmegen * Invited lecture "On degree thresholds of cycles in oriented graphs"	2019
10 <sup>th</sup> European Conference on Combinatorics, Graph Theory and Applications (Eurocomb '19), Bratislava	2019
7 <sup>th</sup> Polish Combinatorial Conference, Będlewo	2018
23 <sup>rd</sup> Midsummer Combinatorial Workshop (MCW), Prague	2018
10 <sup>th</sup> International Colloquium on Graph Theory and combinatorics (ICGT), Lyon	2018
Building bridges II. (70 <sup>th</sup> birthday of Lázsló Lovász) – poster session, Budapest	2018
SIAM Conference on Discrete Mathematics, Denver  * co-organizer of the "Analytic and Probabilistic Techniques in Combinatorics" mini-symposium	2018
International Workshop on Graph Limits, Lyon,  ⋆ Inivited lecture "On large multipartite subgraphs of H-free graphs"	2018
The beauty of discrete mathematics, Montréal QC  * Invited lecture "On degree thresholds of cycles in oriented graphs"	2017
9 <sup>th</sup> European Conference on Combinatorics, Graph Theory and Applications (Eurocomb '17), Vienna	2017
18 <sup>th</sup> International Conference on Random Structures and Algorithms, Gniezno	2017
22 <sup>nd</sup> Midsummer Combinatorial Workshop (MCW), Prague	2017
2 <sup>nd</sup> Mathematical Congress of the Americas, Montréal QC * presentation invited by the "Extremal and Probabilistic Combinatorics" section organizers	2017
Structure in Graphs and Matroids (SiGMa), Waterloo ON	2017
6 <sup>th</sup> Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM '17), Toronto ON * presentation invited by the "Extremal Combinatorics" mini-symposium organizers	2017
AMS Fall Western Sectional Meeting, Denver CO  * presentation invited by the "Recent Advances in Structural and Extremal Graph Theory" special session organizers	2016

AMS Fall Eastern Sectional Meeting, Brunswick ME  * presentation invited by the "New Developments in Graphs and Hypergraphs" special session organizers	2016
SIAM Conference on Discrete Mathematics, Atlanta  * presentation invited by the "Graph Limits and Extremal Combinatorics" mini-symposium organizers	2016
24 <sup>th</sup> Workshop Cycles and Colourings, Nový Smokovec	2015
8 <sup>th</sup> European Conference on Combinatorics, Graph Theory and Applications (Eurocomb '15), Bergen	2015
17 <sup>th</sup> International Conference on Random Structures and Algorithms, Pittsburgh	2015
Adrian Bondy's 70 <sup>th</sup> Birthday Conference, Paris	2014
★ Invited lecture "Semidefinite method and Caccetta-Häggvist conjecture"	·
ICMS Workshop on Extremal Combinatorics, Edinburgh	2014
SIAM Conference on Discrete Mathematics, Minneapolis  **presentation invited by the "Graph coloring" mini-symposium organizers	2014
Workshop in Combinatorics, Szeged  ★ Invited lecture "Subcubic triangle-free graphs have fractional chromatic number at most 14/5"	2014
7 <sup>th</sup> European Conference on Combinatorics, Graph Theory and Applications (Eurocomb '13), Pisa	2013
16 <sup>th</sup> International Conference on Random Structures and Algorithms, Poznań	2013
$7^{\mathrm{th}}$ Czech-Slovak International Symposium on Graph Theory, Combinatorics, Algorithms and Applications, Košice	2013
Erdős Centennial – poster session, Budapest	2013
DIMAP PhD Workshop, Coventry	2013
Probabilistic methods in Graph Theory, Birmingham	2012
Joint Mathematical Conference CSASC, Krems	2011
20 <sup>th</sup> Workshop Cycles and Colourings, Nový Smokovec	2011
17 <sup>th</sup> Midsummer Combinatorial Workshop (MCW), Prague	2011
15 <sup>th</sup> International Conference on Random Structures and Algorithms, Atlanta	2011
19 <sup>th</sup> Workshop Cycles and Colourings, Tatranská Štrba	2010
Workshop on Extremal and Probabilistic Combinatorics, Frauenchimsee	2010
16 <sup>th</sup> Midsummer Combinatorial Workshop (MCW), Prague	2010
18 <sup>th</sup> Workshop Cycles and Colourings, Tatranská Štrba	2009
14 <sup>th</sup> International Conference on Random Structures and Algorithms, Poznań	2009
15 <sup>th</sup> Midsummer Combinatorial Workshop (MCW), Prague	2009
Seminars talks at universities	
Research Seminar Combinatorics, Freie Universität Berlin	Nov 2023
Seminář současné matematiky, Czech Technical University in Prague	Oct 2023
Graph Theory seminar, University of West Bohemia	May 2023
Discrete Mathematics seminar, Karlsruhe Institute of Technology	Apr 2023
Colloqium of Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague	Mar 2023
DIMAP Seminar, University of Warwick	Jan 2023
Algebra colloquium, Charles University in Prague	Nov 2022
Noon Lectures, Charles University in Prague	Nov 2022
GGOAT seminar, Czech Technical University in Prague	Sep 2022
Noon Lectures, Charles University in Prague	Apr 2022
Extremal graph theory seminar, Institute of Computer Science, Czech Academy of Sciences	Mar 2022
	Mar 2022
Séminaire (de calcul) stochastique, University of Strasbourg	Feb 2022
Joint DIMEA and FORMELA seminar, Masaryk University	Nov 2021

Combinatorial and Algebraic Structures Seminar, Czech Technical University in Prague	Nov 2021
GGOAT seminar, Czech Technical University in Prague	Oct 2021
Talk at Současné trendy vědy a moderních technologií, U <sub>3</sub> V, Czech Technical University in Prague (online)	Apr 2021
Seminář současné matematiky, Czech Technical University in Prague (online)	Mar 2021
ITI Online Seminar	Dec 2020
Graphes et Optimisation seminar, LaBRI Bordeaux (online)	Nov 2020
Noon Lectures, Charles University in Prague (online)	Oct 2020
SCMS Combinatorics Seminar, Shanghai Center for Mathematical Sciences (online)	Sep 2020
Joint DIMEA and FORMELA seminar, Masaryk University	Mar 2020
Noon Lectures, Charles University in Prague	Dec 2019
Discrete Mathematics Seminar, Iowa State University	Feb 2019
Extremal Graph Theory Seminar, Universität Hamburg	Jan 2019
Graphs at Ryerson Seminar, Ryerson University	Nov 2018
Extremal graph theory seminar, Institute of Computer Science, Czech Academy of Sciences	Nov 2018
Discrete Mathematics / Algebra Seminar, University of Delaware	Oct 2018
Combinatorics Seminar, Yale University	Oct 2018
The CGLAB algorithms seminar, Carleton University & University of Ottawa	Oct 2018
Noon Lectures, Charles University in Prague	Sep 2018
Combinatorics Seminar, Georgia Institute of Technology	Mar 2018
Combinatorics Seminar, Emory University	Mar 2018
Math and Stats graduate student seminar, McGill University	Mar 2018
Extremal graph theory seminar, Institute of Computer Science, Czech Academy of Sciences	Jan 2018
Noon Lectures, Charles University in Prague	Dec 2017
Discrete Mathematics Seminar, Iowa State University	Dec 2017
MIT combinatorics seminar, Massachusetts Institute of Technology	Nov 2017
The CGLAB algorithms seminar, Carleton University & University of Ottawa	Oct 2017
Extremal graph theory seminar, Institute of Computer Science, Czech Academy of Sciences	Aug 2017
Theoretical computer science Seminar, Jagiellonian University	Aug 2017
Discrete Mathematics Seminar, Iowa State University	Apr 2017
Graph Theory seminar, University of West Bohemia	Mar 2017
MALOTEC seminar, LORIA	Mar 2017
Discrete Math Seminar, Georgia State University	Mar 2017
Combinatorics Seminar, Emory University	Feb 2017
Discrete Mathematics and Optimization Seminar, McGill University	Nov 2016
Math and Stats graduate student seminar, McGill University	Nov 2016
Seminário de Teoria da Computação, Combinatória e Otimização, University of São Paulo	Aug 2016
Mittagseminar, ETH Zürich	Jun 2016
Discrete Mathematics Seminar, Iowa State University	Jun 2016
Séminaire de Mathématiques Discrètes, Grenoble INP	Feb 2016
Combinatorics Seminar, University of Warwick	Jan 2016
Graphes@Lyon, École Normale Supérieure de Lyon	Dec 2015
Mittagseminar, ETH Zürich	Sep 2015
Discrete Mathematics Seminar, Iowa State University	Aug 2015
Combinatorics Seminar, University of Birmingham	Jun 2015
Zürich Graduate Colloquium, ETH Zürich and University of Zürich	Feb 2015
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Mittagseminar, ETH Zürich	Sep 2012
DIMAP Seminar, University of Warwick	May 2014
Noon Lectures, Charles University in Prague	Jan 2014
Algorithmic aspects of combinatorics Seminar, Jagiellonian University	Dec 2013
Combinatorics Seminar, University of Warwick	Oct 2013
Graph Theory and Combinatorics Seminar, University of Illinois at Urbana-Champaign	Oct 2013
Combinatorics Seminar, Georgia Institute of Technology	Sep 2013
Combinatorics Seminar, Emory University	Sep 2013
Graph Theory and Combinatorics Seminar, University of Illinois at Urbana-Champaign	May 2013
Combinatorics Seminar, University of Illinois at Chicago	May 2013
MIT combinatorics seminar, Massachusetts Institute of Technology	May 2013
Combinatorics, Graph Theory and Applications Seminar, UPC - BarcelonaTech	Apr 2013
Seminarium, Adam Mickiewicz University in Poznań	Apr 2013
Combinatorics Study Group, Queen Mary University of London	Mar 2013
Selected Topics in Graph Theory II, University of Illinois at Urbana-Champaign	Mar 2013
Combinatorics Seminar, University of Warwick	Mar 2013
Seminar on Graph Theory and Algorithms, University of Ljubljana	Oct 2011
Public outreach	
Article Pseudonáhodnost (in Czech), Pražská technika, 2022 (6), 24–25.	
Talk at Týden vědy na Jaderce, Czech Technical University in Prague	Jun 2023
Talk at Konference pod stromeček, Czexpats in Science (hybrid)	Dec 2022

Last updated: November 20, 2023

Jan 2021

Talk at Matematika pro život, Czech Technical University in Prague (hybrid)