

# Irena Penev

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Date of birth: January 7, 1983  
Place of birth: Belgrade, Serbia  
Citizenship: Serbia

## Employment

### 2018-present

Assistant Professor

Computer Science Institute of Charles University (IÚUK), Prague, Czech Republic

### 2016-2018

Research Fellow in Graph Theory

University of Leeds, School of Computing, Leeds, UK

Position funded by the EPSRC grant **Structure of Hereditary Graph Classes and Its Algorithmic Consequences**

Principal investigator: Kristina Vušković

### 2015-2016

Postdoctoral Fellow

Technical University of Denmark, Department of Applied Mathematics and Computer Science, Section AlgoLoG, Lyngby, Denmark

Position funded by the ERC Advanced Grant **GRACOL**

Principal investigator: Carsten Thomassen

### 2013–2015

Labex MILYON Postdoctoral Fellow

Université de Lyon, LIP (ENS de Lyon), Team MC2, Lyon, France

Supervisor: Nicolas Trotignon

## 2012–2013

Upper School Math Teacher  
Park Tudor School, Indianapolis, IN, USA

## Education

### 2006–2012

Columbia University, New York, NY, USA

- Ph.D. with distinction, Mathematics, May 2012

Dissertation: *Forbidden substructures in graphs and trigraphs, and related coloring problems* (<https://academiccommons.columbia.edu/catalog/ac:146465>)

Advisor: Maria Chudnovsky

- M.Phil., Mathematics, May 2009
- M.A., Mathematics, May 2007

### 2002–2006

Bryn Mawr College, Bryn Mawr, PA, USA

- A.B. *magna cum laude*, French and Mathematics (Mathematics major at Haverford College), May 2006

## Certificates

Czech: CCE C1, May 2023

French: DALF C1, December 2017

Russian: TORFL-III/C1 [*ТПКИ-III/C1*], July 2018

## Research Interests

Graph theory (especially structural graph theory and graph algorithms)

## Papers

Published

1. Martin Milanič, **Irena Penev**, Nevena Pivač, Kristina Vušković, “Bisimplicial separators”, *Journal of Graph Theory*, 106(4) (2024), 816–842.
2. **Irena Penev**, “Coloring  $(4K_1, C_4, C_6)$ -free graphs”, *Discrete Mathematics*, 346(11) (2023), 113225.

3. **Irena Penev**, “On the structure and clique-width of  $(4K_1, C_4, C_6, C_7)$ -free graphs”, *Journal of Graph Theory*, 99(3) (2022), 435–460.
4. Frédéric Maffray, **Irena Penev**, Kristina Vušković, “Coloring rings”, *Journal of Graph Theory*, 96(4) (2021), 642–683.
5. **Irena Penev**, “On the clique-width of  $(4K_1, C_4, C_5, C_7)$ -free graphs”, *Discrete Applied Mathematics*, 285 (2020), 688–690.
6. Kathie Cameron, Shenwei Huang, **Irena Penev**, Vaidy Sivaraman, “The class of  $(P_7, C_4, C_5)$ -free graphs: decomposition, algorithms, and  $\chi$ -boundedness”, *Journal of Graph Theory*, 93(4) (2020), 503–552.
7. Valerio Boncompagni, **Irena Penev**, Kristina Vušković, “Clique-cutsets beyond chordal graphs”, *Journal of Graph Theory*, 91(2) (2019), 192–246.
  - Valerio Boncompagni, **Irena Penev**, Kristina Vušković, “Clique cutsets beyond chordal graphs”, *LAGOS’17-IX Latin and American Algorithms, Graphs and Optimization, Electronic Notes in Discrete Mathematics*, 62 (2017), 81–86.
8. Martin Milanič, **Irena Penev**, Nicolas Trotignon, “Stable sets in  $\{\text{ISK4, wheel}\}$ -free graphs”, *Algorithmica*, 80(2) (2018), 415–447.
9. Maria Chudnovsky, Louis Esperet, Laetitia Lemoine, Peter Maceli, Frédéric Maffray, **Irena Penev**, “Graphs with no induced five-vertex path or antipath”, *Journal of Graph Theory*, 84(3) (2017), 221–232.
10. **Irena Penev**, “Amalgams and  $\chi$ -boundedness”, *Journal of Graph Theory*, 84(1) (2017), 57–92.
11. **Irena Penev**, Stéphan Thomassé, Nicolas Trotignon, “Isolating highly connected induced subgraphs”, *SIAM Journal on Discrete Mathematics*, 30(1) (2016), 592–619.
12. **Irena Penev**, “Perfect graphs with no balanced skew-partition are 2-clique-colorable”, *Journal of Graph Theory*, 81(3) (2016), 213–235.
13. Pierre Charbit, **Irena Penev**, Stéphan Thomassé, Nicolas Trotignon, “Perfect graphs of arbitrarily large clique-chromatic number”, *Journal of Combinatorial Theory, Series B*, 116 (2016), 456–464.
14. Maria Chudnovsky, **Irena Penev**, Alex Scott, Nicolas Trotignon, “Substitution and  $\chi$ -boundedness”, *Journal of Combinatorial Theory, Series B*, 103(5) (2013), 567–586.
15. Maria Chudnovsky, **Irena Penev**, “The structure of bull-free perfect graphs”, *Journal of Graph Theory*, 74(1) (2013), 1–31.
16. **Irena Penev**, “Coloring bull-free perfect graphs”, *SIAM Journal on Discrete Mathematics*, 26(3) (2012), 1281–1309.
17. Maria Chudnovsky, **Irena Penev**, Alex Scott, Nicolas Trotignon, “Excluding induced subdivisions of the bull and related graphs”, *Journal of Graph Theory*, 71(1) (2012), 49–68.
18. George Weaver, **Irena Penev**, “Fraenkel-Carnap questions for equivalence relations”, *Australasian Journal of Logic*, 10 (2011), 52–66.

19. George Weaver, **Irena Penev**, “Simple expansions of classes satisfying Fraenkel-Carnap properties”, *Bulletin of the Section of Logic*, 39(3/4) (2010), 175–186.
20. George Weaver, **Irena Penev**, “From finitary to infinitary second-order logic”, *Mathematical Logic Quarterly*, 51 (2005), 499–506.

Submitted

1. **Irena Penev**, “The class of  $(2P_3, C_4, C_6)$ -free graphs, part I:  $(2P_3, C_4, C_6)$ -free graphs that contain an induced  $C_7$  or an induced  $T_0$ ”.
2. **Irena Penev**, “The class of  $(2P_3, C_4, C_6)$ -free graphs, part II:  $(2P_3, C_4, C_6, C_7, T_0)$ -free graphs”.
3. **Irena Penev**, S Taruni, Stéphan Thomassé, Ana Trujillo-Negrete, Mykhaylo Tyomkyn, “Two-block paths in oriented graphs of large semidegree”.

### Book chapter

Marthe Bonamy, **Irena Penev**, “Nombre chromatique et sous-graphes induits”, in Sébastien Labbé, Vincent Penelle (ed.), *Informatique Mathématique – Une photographie en 2020*, CNRS Éditions, 1–34.

### Lecture notes

**Irena Penev**, “Linear Algebra 1 & 2” (<https://iuuk.mff.cuni.cz/~ipenev/LALectureNotes.pdf>), Charles University, 2024.

**Irena Penev**, “Combinatorics and Graph Theory 1 & 2” (<https://iuuk.mff.cuni.cz/~ipenev/KGLectureNotes.pdf>), Charles University, 2022.

### Conference and Seminar Talks

Algorithmic Graph Theory Seminar, Monday with Marty and Students of Sunil, October 2023

10th Slovenian Conference on Graph Theory, Kranjska Gora, Slovenia, June 2023

8th Czech-Slovak International Symposium on Graph Theory, Combinatorics, Algorithms and Applications, Prague, Czech Republic, July 2022

Joint Seminar of KAM & IÚUK, Kutná Hora, Czech Republic, September 2021

8th European Congress of Mathematics, Algorithmic Graph Theory Minisymposium (MS – ID 54), Portorož, Slovenia, June 2021 [*online lecture*]

Journées Graphes et Algorithmes (JGA 2020), France, November 2020 [*invited lecture, online*]

Raziskovalni matematični seminar, University of Primorska, Koper, Slovenia, November 2020

*[online lecture]*

GT G&O, LaBRI, Bordeaux, France, September 2020 *[online lecture]*

55th Czech-Slovak Conference on Graph Theory 2020, Faculty of Informatics of Masaryk University, Brno, Czech Republic, August 2020 *[invited lecture]*

Dagstuhl Seminar (Graph Colouring: from Structure to Algorithms), Schloss Dagstuhl, Wadern, Germany, July 2019

Workshop on Even-Hole-Free Graphs, Belgrade, Serbia, April 2019

10th International Colloquium on Graph Theory and Combinatorics (ICGT), Université Claude Bernard Lyon 1, Lyon, France, July 2018

DIMAP Seminar, University of Warwick, Coventry, UK, March 2018

Raziskovalni matematični seminar, University of Primorska, Koper, Slovenia, January 2018

Workshop on Graph Classes, Optimization, and Width Parameters (GROW), Fields Institute, Toronto, ON, Canada, October 2017

IX Latin and American Algorithms, Graphs and Optimization Symposium (LAGOS), CIRM, Marseille, France, September 2017

Structure in Graphs and Matroids (SiGMa), University of Waterloo, Waterloo, ON, Canada, July 2017

Southern Italian Workshop on Algorithms and Graphs, Polignano A Mare, Italy, September 2016

Coloring Graphs at the Technion, Haifa, Israel, July 2015

Algorithmic Graph Theory on the Adriatic Coast, Koper, Slovenia, June 2015

LIMOS Seminar, LIMOS, Clermont-Ferrand, France, February 2015

Rencontres internationales sur les méthodes de décomposition de graphes, CIRM, Marseille, France, January 2015

Séminaire Algorithmique distribuée et graphes, LIAFA, Paris, France, November 2014

Bordeaux Graph Workshop, Bordeaux, France, November 2014

Groupe de travail MC2, LIP, ENS de Lyon, Lyon, France, October 2014

STINT Workshop, Lans-en-Vercors, France, September 2014

Groupe de travail MC2, LIP, ENS de Lyon, Lyon, France, January 2014

Bertinoro Workshop on Algorithms and Graphs, Bertinoro, Italy, December 2013

Journées Graphes et Algorithmes, Orsay, France, November 2013

Séminaire de Mathématiques Discrètes, G-SCOP, Grenoble, France, October 2013

Séminaire Algorithmique distribuée et graphes, LIAFA, Paris, France, October 2013

Discrete Math Seminar, Columbia University, New York, NY, USA, February 2012

New York Combinatorics Seminar, CUNY, New York, NY, USA, October 2011

Discrete Math Seminar, Columbia University, New York, NY, USA, September 2011

Discrete Math Seminar, Princeton University, Princeton, NJ, USA, September 2010

Discrete Math Seminar, Columbia University, New York, NY, USA, April 2010

### **Teaching (in English unless specified otherwise)**

At IÚUK, Charles University:

- Lectures
  - Linear Algebra II (Summer 2025, Summer 2024, Summer 2023)
  - Linear Algebra I (Winter 2024, Winter 2023, Winter 2022)
  - Combinatorics and Graph Theory II (Summer 2022, Summer 2021)
  - Combinatorics and Graph Theory I (Winter 2021, Winter 2020)
  - Set Theory (Summer 2020, Summer 2019)
  - Mathematical Analysis I (Summer 2020)
  - Topics in Structural Graph Theory and Algorithms (Summer 2022, Winter 2019)
  - Selected Chapters on Graph Theory (Winter 2018)
- Tutorials (one section per semester unless specified otherwise)
  - Combinatorics and Graph Theory II (Summer 2022, Summer 2021)
  - Combinatorics and Graph Theory I (Winter 2021, Winter 2020)
  - Combinatorics and Graph Theory I [*Kombinatorika a grafy I*] (in Czech) (Winter 2021)
  - Set Theory (Summer 2020)
  - Mathematical Analysis I (Summer 2020, Winter 2019)
  - Linear Algebra II (Summer 2025 - three sections, Summer 2024, Summer 2023 - three sections, Summer 2019)
  - Linear Algebra I (Winter 2024 - three sections, Winter 2023 - two sections, Winter 2022 - three sections, Winter 2019, Winter 2018)

- Seminars
  - Combinatorics seminar, co-organized with Martin Loeb and Martin Tancer (Summer 2024, Summer 2022)
  - Combinatorics seminar [*Kombinatorický seminář*], co-organized with Martin Tancer (in Czech) (Winter 2021)
  - Combinatorics seminar [*Kombinatorický seminář*], co-organized with Ondřej Pangrác and Martin Tancer (in Czech) (Summer 2021, Winter 2020)

At the School of Computing, University of Leeds

- Lectures with tutorials
  - Graph Theory: Structure and Algorithms (Spring 2018, Spring 2017)

At the Computer Science Department, ENS de Lyon (in French)

- Teaching assistant [*Chargée de TD*]
  - Probability [*L3 Probabilités*] (Spring 2015)
  - Foundations of computer science and calculability [*L3 FDI – Fondement de l’Informatique / Calculabilité*] (Fall 2014)
  - Logic [*L3 Logique*] (Spring 2014)

At the Department of Mathematics, Columbia University

- Instructor
  - Calculus II (Spring 2012)
  - Calculus I (Fall 2011)
  - Linear Algebra (Summer 2011, Summer 2010)
  - College Algebra (Spring 2009, Fall 2008)
- Teaching assistant
  - Ordinary Differential Equations (Spring 2011)
  - Calculus IV (Spring 2010, Spring 2008)
  - Linear Algebra (Fall 2010, Summer 2009, Summer 2008, Summer 2007)
  - Analysis and Optimization (Fall 2009)
  - Intro to Modern Analysis I (Summer 2009)
  - Calculus III (Fall 2007, Summer 2007)

At the Science Honors Program, Columbia University

- Instructor
  - Graph Theory (Spring 2012, Fall 2011)

At Bryn Mawr College

- Undergraduate teaching assistant
  - Abstract Algebra II (Spring 2006)
  - Discrete Mathematics (Fall 2005)
  - Intro to Logic (Fall 2004, Fall 2003)

### Master's thesis supervision

- Kasper Szabo Lyngsie, *The 1,2,3 Conjecture and related problems* (co-supervised with Carsten Thomassen), Technical University of Denmark, 2016.

### Committees and conference organization

Member of the Program Committee, Canadian Discrete and Algorithmic Mathematics (CanaDAM 2025), May 2025

Member of the Jury, Prix Delorme (2023-present)

Member of the Program Committee, 49th International Workshop on Graph-Theoretic Concepts in Computer Science (WG2023), June 2023

Member of the Program Committee, 8th Czech-Slovak International Symposium on Graph Theory, Combinatorics, Algorithms and Applications, July 2022

Organizer of the *Graph colouring* mini-symposium, 28th British Combinatorial Conference (BCC 2021), Durham University, July 2021 [*online*]

### Service

Member of the Academic Senate of the Faculty of Mathematics and Physics of Charles University (AS MFF UK), 2023–present

Organizer of the *Noon seminar*, KAM & IÚUK, Charles University (2018–2021)

Co-organizer of the *Séminaire Graphes et structures discrètes*, LIP, ENS de Lyon (2013–2015)

Referee for the following journals:

- *Algorithmica*
- *Applicable Analysis and Discrete Mathematics*
- *Combinatorica*

- *Discrete Applied Mathematics*
- *Discrete Mathematics*
- *Electronic Journal of Combinatorics*
- *European Journal of Combinatorics*
- *Graphs and Combinatorics*
- *Journal of Combinatorial Optimization*
- *Journal of Combinatorial Theory, Series B*
- *Journal of Graph Theory*
- *SIAM Journal on Discrete Mathematics*

Referee for the following conferences:

- 48th International Symposium on Mathematical Foundations of Computer Science (MFCS 2023), 2023
- Integer Programming and Combinatorial Optimization, 2016