

# Isaac Konan

Visiting Assistant Professor in Mathematics

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## Employment

2020–2021 **Visiting Assistant Professor**, Institut de Recherche en Informatique Fondamentale, Université de Paris.

## Education

2017–  
(defended on  
04/12/2020) **Ph.D.**, Université Paris Diderot, France, Advisor: Jeremy Lovejoy.  
Title: *Rogers-ramanujan type identities: bijective proofs and Lie-theoretic approach*

2014–2016 **Master in Fundamental Mathematics**, Université Paris Saclay - (Paris Sud), France, Major: Arithmetics and Geometry.  
Master grant of Fondation Mathématiques Jacques Hadamard

2012–2014 **Bachelor(Licence) in Fundamental Mathematics**, Université Paris Sud - Paris 11, France.

## Research interests

Combinatorics and Number Theory

- Integer partitions and  $q$ -series
- Rogers-Ramanujan type identities

Representation theory of Lie Algebras

- Statistical physics

## Publications

### Publication in journals

1. *A bijective proof and generalization of Siladić's theorem*, European Journal of Combinatorics, Volume 87, June 2020, 103101.  
<https://doi.org/10.1016/j.ejc.2020.103101>
2. *Beyond Göllnitz' theorem I: a bijective approach*, accepted for publication in JCTA  
<https://arxiv.org/abs/1909.00364>.

### Preprint and submitted

1. *Beyond Göllnitz' theorem II: arbitrary many primary colors*,  
<https://arxiv.org/abs/1912.06702>.
2. *Generalizations of Capparelli's and Primc's identities, I: colored Frobenius partitions and combinatorial proofs*,  
<https://arxiv.org/abs/1911.13191> with J. Dousse
3. *Generalizations of Capparelli's and Primc's identities, II: perfect  $A_{n-1}^{(1)}$  crystals and explicit characters formulas*,  
<https://arxiv.org/abs/1911.13189> with J. Dousse
4. *Weighed words at degree two, I: Bressoud's algorithm as an energy transfer*,  
<https://arxiv.org/abs/2001.10927>.
5. *Weighed words degree two, II: flat partitions, regular partitions, and application to level one perfect crystals*,  
<https://arxiv.org/abs/2002.00300>.

### Publications in conference proceedings

- 2018 A bijective proof and generalization of Siladić's theorem (extended abstract), FPSAC 2018,  
<https://www.mat.univie.ac.at/~slc/wpapers/FPSAC2018/03-Konan.pdf>.
- 2020 Beyond Göllnitz' theorem I: a bijective approach, FPSAC 2020,  
<https://www.mat.univie.ac.at/~slc/wpapers/FPSAC2020/2-Konan.pdf>.

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## Talks

- 2020 FPSAC online.
- 2020 Plateau Saclay Combinarics seminar, LIX, Palaiseau, France.
- 2019 Combinarics seminar, UC Berkeley, Berkeley, USA.
- 2019 Combinarics and Interactions seminar, IHP, Paris, France.
- 2019 ALEA days 2019, CIRM, Marseille, France.
- 2018 Enumerative and analytic Combinatorics Seminar, IRIF, Paris, France.
- 2018 Algorithmic and Enumerative Combinatorics Summer School 2018, Johannes Kepler University Linz, Hagenberg, Austria.
- 2018 FPSAC 2018, Dartmouth College, Hanover, USA.
- 2018 School of young researchers in Number Theory, University of Franche-Comté, Besançon, France.
- 2018 Algebra, arithmetics and combinatorics of Differential and Difference Equations, CIRM, Marseille, France.
- 2018 ALEA days 2018, CIRM, Marseille, France.
- 2017 Phd students' seminar, IRIF, France.

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## Research visits

- Jan 2020 Mathematics department, Berkeley, USA.  
Supervisor: Jeremy Lovejoy
- Jan 2020 Institut Camille Jordan, Lyon, France.  
Collaborator: Jehanne Dousse
- Dec 2019 Mathematics department, Berkeley, USA.  
Supervisor: Jeremy Lovejoy
- May 2019 Institut Camille Jordan, Lyon, France.  
Collaborator: Jehanne Dousse
- April-May 2019 Mathematics department, Berkeley, USA.  
Supervisor: Jeremy Lovejoy
- March–July 2016 Research internship supervised by Jeremy Lovejoy, LIAFA, Université Paris Diderot: *Autour des  $q$ -series, des formes modulaires quantiques et des nœuds toriques*

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## Teaching

- 2020–2021 Teaching assistant, Université Paris de Paris: *Algorithm and Complexity* (graduate course).
- 2020–2021 Teaching assistant, Université Paris de Paris: *Discrete Mathematics* (undergraduate course).
- 2019–2020 Teaching assistant, Université Paris Diderot: *Projects in Mathematics* (undergraduate course).
- 2019–2020 Teaching assistant, Université Paris Diderot: *Elementary Analysis* (undergraduate course).
- 2018–2019 Teaching assistant, Université Paris Diderot: *Introduction to Arithmetics* (undergraduate course).
- 2018–2019 Teaching assistant, École d'Ingénieur Denis Diderot: *Engineering Mathematics* (undergraduate course).
- 2017–2018 Teaching assistant, Université Paris Diderot: *Advanced Analysis and Algebra* (undergraduate course).

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## Other professional activities

- Jury member for the Orsay marathon of mathematics since 2018.
- Animateur for Club Animath project in Côte d'Ivoire.
- Reviewer for Journal of Combinatorial Theory Series A, European Journal of Combinatorics.

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## Languages

- French Native speaker
- English Advanced

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## Awards

- Silver medallist, International Mathematics Olympiads (Astana 2010)
- Gold medallist, Panafrican Mathematics Olympiads (Yamoussoukro 2010 and Pretoria 2009).