# 33rd International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms

**AofA 2022, June 20–24, 2022, Philadelphia, PA, USA**

Edited by

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Dedicated to the memory of Philippe Flajolet.

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# Preface

The 33rd International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA 2022) was held in Philadelphia, PA, USA, at the University of Pennsylvania, during June 20–24, 2022.

Analysis of algorithms is a scientific basis for computation, providing a link between abstract algorithms and the performance characteristics of their implementations in the real world. The general effort to predict precisely the performance of algorithms has come to involve research in analytic combinatorics, the analysis of random discrete structures, asymptotic analysis, exact and limiting distributions, and other fields of inquiry in computer science, probability theory, and enumerative combinatorics.

See `http://aofa.cs.purdue.edu/` for more details.

The Call for Papers invited papers in

- analytic algorithmics and combinatorics,
- probabilistic analysis of algorithms,
- randomized algorithms.

We also welcomed papers addressing problems such as: combinatorial algorithms, string searching and pattern matching, sublinear algorithms on massive data sets, network algorithms, graph algorithms, caching and memory hierarchies, indexing, data mining, data compression, coding and information theory, and computational finance. Papers were also welcomed that address bridges to research in related fields such as statistical physics, computational biology, computational geometry, and simulation.

Authors of selected accepted extended abstracts will be invited to submit full papers for peer review to a special issue of a journal.

Mark Daniel Ward,
on behalf of the Program and Steering Committees

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# Flajolet Lecture

The Philippe Flajolet Lecture Prize for outstanding contributions to analytic combinatorics and analysis of algorithms is awarded every two years by the Analysis of Algorithms (AofA) community – a community that owes its existence to Philippe Flajolet. The first Flajolet Lecture was presented by Donald E. Knuth at the 25th International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms in 2014 in Paris, France. The second Flajolet Lecture was presented by Robert Sedgewick at the 27th AofA Conference in 2016 in Krakow, Poland. The third Flajolet Lecture was presented by Luc Devroye at the 29th AofA Conference in 2018 in Uppsala, Sweden.

The fourth Flajolet Lecture was scheduled to be presented by Wojciech Szpankowski at the 31st AofA Conference in 2020, but the lecture was delayed for two years, due to the COVID-19 pandemic. Therefore, at this year's conference, he presented the fourth Flajolet Lecture, entitled "Analytic Information and Learning Theory: From Compression to Learning." Svante Janson also presented the fifth Flajolet Lecture, entitled "The Sum of Powers of Subtree Sizes for Random Trees."

The prize is named in honor and recognition of the extraordinary accomplishments of the late Philippe Flajolet, who spent most of his scientific life at INRIA, France. Philippe is best known for fundamental advances in mathematical methods for the analysis of algorithms. His research laid the foundation of a subfield of mathematics now known as analytic combinatorics. Analytic combinatorics is a modern basis for the quantitative study of combinatorial structures (such as words, trees, mappings, and graphs), with applications to probabilistic study of algorithms that are based on these structures. It also strongly influences research in other scientific domains, such as statistical physics, computational biology, and information theory. Flajolet's work takes the field forward by introducing original approaches in combinatorics based on two types of methods: symbolic and analytic. The symbolic side is based on the automation of decision procedures in combinatorial enumeration to derive characterizations of generating functions. The analytic side treats those functions as functions in the complex plane and leads to precise characterization of limit distributions. Beyond these foundational contributions, Philippe's research opened new avenues in various domains of applied computer science, including streaming algorithms, communication protocols, database access methods, data mining, symbolic manipulation, text-processing algorithms, and random generation.

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