# 29th International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms

**AofA 2018, June 25–29, 2018, Uppsala, Sweden**

Edited by

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Dedicated to the memory of Philippe Flajolet.

# Contents



## Flajolet Award Lecture



## Keynote Speakers



29th International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA 2018).
Editors: James Allen Fill and Mark Daniel Ward
Leibniz International Proceedings in Informatics
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## Regular Papers

# Preface

The 29th International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA 2018) was held in Uppsala, Sweden, June 25–29, 2018.

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/ .

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 (published circa late 2019) of *Algorithmica*.

—James Allen ("Jim") Fill and 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, and the second one by Robert Sedgewick at the 27th AofA Conference in 2016 in Krakow, Poland.

At this year's conference, Luc Devroye presented the third Flajolet Lecture, entitled "OMG: GW, CLT, CRT and CFTP."

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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# Organization and Funding

Local organization of the conference was coordinated by Cecilia Holmgren (Uppsala University, Sweden) and Sofie White (Uppsala, Sweden), in coordination with Program Committee Chair Jim Fill (Johns Hopkins University, USA). The conference location was the Campus Blåsenhus of Uppsala University.

Generous funding for the conference was provided by the Marcus Wallenberg Foundation for International Scientific Collaboration and by the Swedish Research Council.

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