



Fellow	Jonas Ellert
Host Organisation	CWI Amsterdam
Scientific coordinator	Solon Pissis



I - SCIENTIFIC ACTIVITY DURING YOUR FELLOWSHIP

The research during the fellowship concerned space-efficient algorithms and data structures for strings in sublinear and restricted-access computational models. Two previously started projects were completed.

The first project studies periodicity in the property-testing model, where an algorithm may inspect only a few positions of the input and must decide, with high probability, whether a string is periodic or far from every periodic string. The new work extends this framework to strings that contain wildcard (“don’t-care”) symbols, which may match any character. It develops property testers for periodicity in this setting and analyses their query complexity, showing how the presence of wildcards affects the number of positions that must be examined.

The second project concerns the asymmetric streaming model, in which an algorithm has read-only access to a short reference string while a longer text arrives as a stream, and only sublinear working memory is available. Its central contribution is a new data structure, obtained via function inversion, providing fast random access to the longest suffix of the part of the stream seen so far. Used as a generic reduction from the asymmetric streaming model to the online read-only model, it improves the state of the art for several fundamental problems, including versions of pattern matching and relative Lempel-Ziv compression.

Ongoing work started during the fellowship concerns further algorithms and data structures for strings, including data structures for answering specific types of range queries in suffix trees, and data structures for querying protein-protein interaction networks.

II - PUBLICATION(S) DURING YOUR FELLOWSHIP

C. Barton, P. Charalampopoulos, T. El Ghazi, J. Ellert, O. Lachish, T. Starikovskaya. *Periodicity Property Testing on Strings with Wildcards*. 37th Annual Symposium on Combinatorial Pattern Matching (CPM 2026), LIPIcs vol. 369, pp. 28:1–28:18, 2026. <https://doi.org/10.4230/LIPIcs.CPM.2026.28>

P. Charalampopoulos, T. El Ghazi, J. Ellert, P. Gawrychowski, T. Starikovskaya. *Suffix Random Access via Function Inversion: A Key for Asymmetric Streaming String Algorithms*. 53rd International Colloquium on Automata, Languages, and Programming (ICALP 2026), pp. 55:1–55:20, 2026. <https://doi.org/10.4230/LIPIcs.ICALP.2026.55>



III - ATTENDED SEMINARS, WORKHOPS, CONFERENCES

37th Annual Symposium on Combinatorial Pattern Matching (CPM 2026), Copenhagen, Denmark, 15-17 June 2026.

53rd International Colloquium on Automata, Languages, and Programming (ICALP 2026), Royal Holloway, University of London, UK, 7-10 July 2026.

IV - RESEARCH EXCHANGE PROGRAMME (REP)

No Research Exchange Programme visit to another ERCIM institute was undertaken during the fellowship period.