Citation for Assaf Naor. The Ostrowski Prize for 2019 is awarded to Assaf Naor for his groundbreaking work to areas in the meeting point of the geometry of Banach spaces, the structure of metric spaces, and algorithms. The nature of his contribution is threefold: Solutions of hard problems, setting a significant research direction for him and others to follow, and finding deep connections between pure mathematics and computer science.

Since mid-nineties, geometric methods have played an influential role towards designing algorithms for computational problems that a priori have little connection to geometry. Assaf Naor is *the* world-leader on this topic, building a long-term, cohesive research program. He has discovered and applied deep results from the theory of Banach spaces and quantitative metric geometry to solve long-standing algorithmic questions, and in turn, has solved long-standing questions in analysis via techniques that are sometimes motivated by algorithmic applications. This has often led to development of new theories, e.g. the non-linear spectral calculus and understanding of the geometry of the Heisenberg group.

One particular focus of his research is on computing the "sparsest cut" in graphs, i.e., to cut an n-vertex graph into two parts such that the number of edges across the two parts is minimized while requiring the two parts to be "balanced". This is an NP-hard problem, so the goal is to compute an approximate sparse cut. A specific algorithm is based on linear programming relaxation. Its approximation factor is the same as the distortion needed to embed a corresponding class of n-point metrics into L_1. Assaf Naor proved that a ball of radius n in the Heisenberg group does not Lipschitz embed into L_1 with distortion better than $\sqrt{\log n}$. As a consequence, the semidefinite program for the sparsest cut problem on inputs of size n is at least of order $\sqrt{\log n}$, matching the known upper bound.

Assaf Naor is an Israeli American and Czech mathematician. He was born in 1975 in Rehovot, Israel. He finished his PhD in mathematics at the Hebrew University in Jerusalem in 2002. After holding positions at Microsoft Research, the University of Washington, and the Courant Institute of Mathematical Sciences, he has got a professorship at the Princeton University in 2014.