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Department of Mathematical Sciences

A conceptual breakthrough in sphere packing

What is the densest packing of congruent spheres in Euclidean space? This problem arises naturally in geometry, number theory, and information theory, but it is notoriously difficult to solve, and until recently no sharp bounds were known above three dimensions. In 2016 Maryna Viazovska found a remarkable solution of the sphere packing problem in eight dimensions, which is much simpler than the proof in three dimensions but tells us nothing about dimensions four through seven. In this talk Cohn describes how her breakthrough works and where it comes from, as well as follow-up work extending it to twenty-four dimensions (joint work with Kumar, Miller, Radchenko, and Viazovska).

Henry Cohn is currently a principal researcher (and one of three founding members) at Microsoft Research New England in Cambridge, Massachusetts, and an adjunct professor in the MIT Department of Mathematics. Previously he was head of the cryptography group at Microsoft Research Redmond, and prior to that, he was a senior researcher in the theory group. His mathematical interests include discrete geometry, coding theory, cryptography, combinatorics, computational number theory, and theoretical computer science. Henry Cohn earned a BS from MIT in 1995, and a PhD in mathematics in 2000 from Harvard, under the direction of Noam Elkies.

Friday, Nov. 2, 4pm
Higgins Labs 218



Levi Leonard Conant, 1857–1916, was a mathematician and educator who spent most of his career as a faculty member at Worcester Polytechnic Institute; he served as head of the Mathematics Department and as acting president from 1911 to 1913. An outstanding teacher, and an active scholar, published many articles in scientific journals and wrote four textbooks. His large bequest to the American Mathematical Society established the Levi L. Conant Prize, awarded annually to recognize the best expository paper published in either *Notices of the AMS* or *Bulletin of the AMS* in the previous five years.

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