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**Arnold, V. I.**

**Experimental mathematics.**

MSRI Mathematical Circles Library 16. Providence, RI: American Mathematical Society (AMS); Berkeley, CA: Mathematical Sciences Research Institut (MSRI) (ISBN 978-0-8218-9416-3/pbk). vii, 158 p. (2015).

The work under review is indeed a delightful book full of ideas, deep mathematical connections, unexpected solutions and open problems, all consisting the portrait of a master of our time: Vladimir Arnold. These collected lectures of Arnold at the Dubna summer camp of 2005 reveal a very dynamic, effective, yet extremely demanding teaching. Well-stated by Marc Saul at the preface : “The most exciting aspect of mathematics for Arnold, seems to have been a dynamic search for pattern through examination of many special cases”. Thus, this book entitled “Experimental Mathematics” achieves at each lecture an innovative role of starting with “naive experimentation” and immediately after a few pages, becoming extremely profound and condensed concerning mathematical thinking. The book consists of four lectures and only twenty references! Statistics of Topology and Algebra (Lecture 1), Combinatorial Complexity and randomness (Lecture 2), Random permutations and Young diagrams of their cycles (Lecture 3) and Geometry of Frobenius numbers for additive semigroups (Lecture 4) form a very competitive mathematical environment for each reader. Starting from Hilbert’s sixteenth problem connected with smooth functions, topology and algebraic geometry in Lecture 1, is passing to binary sequences finally related with complexity and randomness in Galois fields in Lecture 2. In Lecture 3 Young diagrams is the basis for random permutations of larger numbers of elements, while in Lecture 4 Sylvester’s theorem leads to the geometry of continued fractions of Frobenius numbers. It is not really four lectures, but a true mind adventure in the world of “Experimental Mathematics” of Arnold.

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*Classification:* A80 F60 H40 K20 I70

*Keywords:* combinatorial complexity; randomness; permutation; Young diagrams; Frobenius numbers; additive semigroups; binary sequences; Galois fields