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**Stefan Papadima** ([Stefan.Papadima@imar.ro](mailto:Stefan.Papadima@imar.ro)), Institute of Mathematics, Romanian Academy, 70700 Bucharest, Romania, and **Alexander I Suciuc\*** ([alexsuciu@neu.edu](mailto:alexsuciu@neu.edu)), Department of Mathematics, Northeastern University, Boston, MA 02115. *Chen Lie algebras and combinatorics of arrangements.*

Using Malcev completion techniques, we show that the rational Chen Lie algebra of the fundamental group of the complement of a complex hyperplane arrangement is isomorphic to the rational holonomy Lie algebra of the arrangement, modulo the second derived subalgebra. Consequently, the rational Chen Lie algebra is combinatorially determined. We also show that the Hilbert series of this (graded) Lie algebra is determined by the Hilbert series of the linearized Alexander invariant of the arrangement, viewed as a module over the polynomial ring in variables corresponding to the hyperplanes. (Received August 16, 2002)