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Geometry and physics of proteins JAYANTH R. BANAVAR, Department of Physics, The Pennsylvania State University, University Park, PA 16802, MAREK CIEPLAK, Institute of Physics, Polish Academy of Sciences, 02-668 Warsaw, Poland, TRINH X. HOANG, Institute of Physics and Electronics, Vietnamese Academy of Science and Electronics, 10 Dao Tan, Hanoi, Vietnam, AMOS MARI-TAN, FLAVIO SENO, ANTONIO TROVATO, Dipartimento di Fisica, Universita degli Studi di Padova, 35100 Padova, Italy — We recall some of the key lessons of protein research over the last several decades and show that they strongly suggest a new framework for understanding proteins. The unified framework is useful for understanding protein folding, amyloid formation and protein interactions and has important implications for natural selection. The experimental data and our new approach, supported by computer simulations, reveal an astonishing simplicity underlying the protein problem.

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