1. Record Nr. UNINA9910823442903321

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Titolo	Lattice sums then and now / / J.M. Borwein, University of Newcastle, New South Wales, M.L. Glasser, Clarkson University, New York R.C. Mcphedran, University of Sydney, J.G. Wan, University of Newcastle, New South Wales, I.J. Zucker, King's College London [[electronic resource]]
Pubbl/distr/stampa	Cambridge : , : Cambridge University Press, , 2013
ISBN	1-139-89304-1 1-107-42515-8 1-107-42299-X 1-107-41992-1 1-107-41730-9 1-139-62680-9 1-107-42114-4 1-107-41857-7
Descrizione fisica	1 online resource (xix, 368 pages) : digital, PDF file(s)
Collana	Encyclopedia of mathematics and its applications ; ; volume 150
Classificazione	MAT022000
Disciplina	511.3/3
Soggetti	Lattice theory Number theory
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Title from publisher's bibliographic system (viewed on 05 Oct 2015).
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Lattice sums -- Convergence of lattice sums and Madelung's constant -- Angular lattice sums -- Use of Dirichlet series with complex characters -- Lattice sums and Ramanujan's modular equations -- Closed form evaluations of three- and four-dimensional sums -- Electron sums -- Madelung sums in higher dimensions -- Seventy years of the Watson integrals.
Sommario/riassunto	The study of lattice sums began when early investigators wanted to go from mechanical properties of crystals to the properties of the atoms and ions from which they were built (the literature of Madelung's constant). A parallel literature was built around the optical properties of regular lattices of atoms (initiated by Lord Rayleigh, Lorentz and Lorenz). For over a century many famous scientists and mathematicians

have delved into the properties of lattices, sometimes unwittingly duplicating the work of their predecessors. Here, at last, is a comprehensive overview of the substantial body of knowledge that exists on lattice sums and their applications. The authors also provide commentaries on open questions, and explain modern techniques which simplify the task of finding new results in this fascinating and ongoing field. Lattice sums in one, two, three, four and higher dimensions are covered.