May 2026
104 publications

LIST OF PUBLICATIONS WITH A COMMENTARY

BOOKS

[1] Boolesche Algebra und Anwendungen. Österr.Bundesverlag, Wien (1975). - Gem.mit H.Bürger und W.Nöbauer

[2] Lineare Optimierung und Anwendungen. Österr.Bundesverlag,Wien (1977). - Gem.mit W.Nöbauer und W. Timischl

[3] Mathematische Grundlagen für Chemiker I. Prugg-Verlag, Wien-Eisenstadt (1977). - Gem.mit H.Kaiser

[4] Mathematische Grundlagen für Chemiker II. Prugg-Verlag, Eisenstadt (1981). - Gem.mit G.Eigenthaler und H.Kaiser

[5] Mathematische Grundlagen für Chemiker III-Aufgabensammlung. Prugg-Verlag, Eisenstadt (1983). - Gem.mit G.Eigenthaler und G.Hasibeder

[6] Allgemeine Algebra und Anwendungen. Teubner-Verlag, Stuttgart (1984). - Gem.mit W.Müller

[7] Mathematik für Wirtschaftsinformatiker - Grundlagen, Modelle, Programme, Bd.I. Springer-Verlag Wien (1988, 2.Aufl. 1996). - Gem.mit G.Karigl

[8] Mathematik für Wirtschaftsinformatiker - Grundlagen, Modelle, Programme, Bd.II. Springer-Verlag Wien (1988, 2.Aufl. 1999). - Gem.mit G.Karigl

PAPERS

[9] Zusammenhang zwischen kubischen und biquadratischen endlichen Graphen (Teil I). Sb.Österr.Akad.Wiss.Math.-naturw.Kl.178 (1969), 359-378

[10] Zusammenhang zwischen kubischen und biquadratischen endlichen Graphen (Teil II). Sb.Österr.Akad.Wiss.Math.-naturw.Kl.179 (1970), 215-232

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[12] Über Eulersche und paare Hamiltonsche Graphen. Czech.Math.J. 22 (1972), 600-611

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[14] Über die Wortlänge von Polynomfunktionen auf Verbänden. Monatsh.Math. 77 (1973), 97-104

[15] Über den Grad von Polynomfunktionen auf Verbänden. Abh.Math. Sem.Univ.Hamburg 42 (1974),147-153. -Gem.mit J.Wiesenbauer

[16] Modulare Polynomverbände über endlichen distributiven Verbänden. Monatsh.Math. 78 (1974), 305-310

[17] Über die Anzahl von Polynomen und Polynomfunktionen auf endlichen Verbänden. J.reine angew.Math. 273 (1975),199-205.

[18] Ein Test für die Hochschulreife aus Mathematik. DdM 3 (1975), Heft 1,72-79. -Gem.mit H.Kaiser

[19] Polynomials and polynomial functions on lattices. Proceed. Lattice Theory Conf.Ulm (1975), 48-53

[20] Ein Distributivitätskriterium für Verbände. Monatsh.Math. 81 (1976), 1-3.

[21] Anzahlsätze für Polynomfunktionen auf Verbänden. Rend.Inst. di Matem.Univ.Trieste 8 (1976), 135-141. -Gem.mit J.Wiesenbauer

[22] Optimierungsaufgaben im Mathematikunterricht an höheren Schulen. In: Anwendungs-orientierte Mathematik in der Sekundarstufe II. Verlag J.Heyn, Klagenfurt (1977), 59-66

[23] Fortbildungsseminare als Möglichkeit zur Weiterbildung der Mathematiklehrer. DdM 6 (1978),Heft 1, 65-69.- Gem.mit W.Nöbauer

[24] Local polynomial functions on distributive lattices. An.Acad. brasil.Cienc. 50(4) (1978), 433-437

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[29] Local polynomial functions on lattices and universal algebras. Coll.Math. 42 (1980), 83-93.- Gem.mit W.Nöbauer

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[31] On generating sets of order-preserving functions over finite lattices. Coll. Math. Soc. J. Bolyai 33 (1980) 317-324

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[33] On compatible and order-preserving functions on lattices. Banach Center Publ. 9 (1982), 97-104. - Gem.mit G.Eigenthaler

[34] An explicit formula for the solution of the Fisher-Wright selection model in population genetics. Discrete Appl.Math. 6 (1983), 209-212. - Gem.mit H.Länger

[35] Zur Darstellung von Observablen auf σ-stetigen Quantenlogiken. Sb. Österr. Akad. Wiss. Math.-naturwiss. Kl. 192 (1983), 169-176. - Gem. mit H.Länger und M.Maczynski

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[75] On characteristic polynomials of vertex-and edge-weighted molecular graphs. PAMM Proc. Appl. Math. Mech. **7**, (2007), 20700003–20700004

[76] On a characterization of physical systems by spaces of numerical events. ARGESIM Report 35 (2009), 601-607 – Gem. mit H.Länger

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[83] On bounded posets arising from quantum mechanical measurements. Int. J. Theor. Phys. 55 (2016), 4453-4461. DOI 10.1007/s10773-016-3068-x. – Gem mit H.Länger

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[92] On ring-like structures of lattice-ordered numerical events. Asian-European J. Math.14 (2021), 2150186-1 - 2150186-10. DOI: 10.1142/S1793557121501862 – Gem. mit H.Länger

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EDITOR OF PROCEEDINGS AND OTHER COLLECTIONS

[97] Constributions to General Algebra 6. Hölder-Pichler-Tempsky, Wien und Teubner-Verlag, Stuttgart (1988). -Gem.mit G.Eigenthaler, H.K.Kaiser und W.B.Müller.

[98] Constributions to General Algebra 7. Hölder-Pichler-Tempsky, Wien und Teubner-Verlag, Stuttgart (1991). -Gem.mit G.Eigenthaler, H.K.Kaiser und W.B.Müller.

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COMMENTARY ON THE RESEARCH PAPERS

Of the scientific papers, 33 were published without any co-authors. Among the co-authors H. Länger ranks first in terms of the number of joint publications.

1. PAPERS IN DISCRETE MATHEMATICS

These include the papers [9] – [12] on regular graphs as well as publications on problems in chemistry and biology where graph-theoretic methods are widely used (see sections 3.2 and 3.3 of this commentary). Further, there are the papers on the solution of a difference equation [36], the triangulation of matrices [43] and on a conjecture of Fejes Tóth and J.Molnár concerning the thinnest covering of the plane by incongruent circles [13], [84], [86]. (The conjecture of Fejes Tóth and J.Molnár was formulated in 1958, proved in essence for the case that only two distinct kinds of circles can occur in 1961 and unsuccessfully attempted to be proved by myself as a student. Back then I postponed this problem to the years after my retirement. At that time, I actually managed to find a solution by building on the results I had achieved as a student.)

2. PAPERS IN LATTICE THEORY

The main focus is on polynomials and polynomial functions on lattices [14] – [17], [19] – [21], [24], [27] – [31], [33]. Particularly mentionable are results of [33] achieved together with G. Eigenthaler, as they have been included in one of the most authorative books on lattice theory (G. Grätzer, Lattice Theory: Foundation, Birkhäuser 2011). – Lattice-theoretic methods are also used within papers on axiomatic quantum mechanics (see 3.1 of this commentary) and are employed for cryptographic purposes [71], [72].

3. PAPERS RELATING TO NATURAL SCIENCES

3.1 PHYSICS (Quantum Mechanics)

Research on the representation of observables [35], [37] is followed by a series of papers on quantum logic [58], [59], [60], [62] – [64], [66], [73], [74], [76] – [83], [85], [87] – [96]. In these papers ring-like quantum logics as well as various generalizations of the concept of Hilbert-logics play a key role as they allow for descriptions of several quantum mechanical effects and to distinguish between a quantum behavior and one which is characteristic for phenomena of classical physics.

3.2 BIOLOGY

Following the papers on an explicit solution of the Fisher-Wright model of population genetics [34] and on the spread of infections [38] is a series of publications on the arrangement of chromosomes during cell division [39], [40], [42], [45], [48] – [52], [54], [56], [57], [65]. In particular, it is shown that the Bennett model on the arrangement on chromosomes, then well known among cell-biologist, is mathematically inconsistent and hence most likely biologically unjustified.

3.3 CHEMISTRY (On the theory of molecular orbitals)

These papers deal with characteristic polynomials of molecular graphs with different heteroatoms (different Coulomb integrals) and unequal attractive forces between atoms (different resonance integrals) in order to determine molecular orbitals. [67] – [70], [75]. The paper [68] is somewhat more general, it deals with the energy function of an arbitrary n-component system in quantum mechanics.

4. WORKS ON THE DIDACTICS OF APPLIED MATHEMATICS

These papers are primarily aimed at explaining mathematical methods to practioners [32], [41], [44], [53], [61]) or are directed specifically at high school teachers ([22], [23], [26], [46], [47], [100], [102]). A test for the university level proficiency in mathematics is also developed and statistically analysed [18], [25].