

Some Books and Papers on the Order Structure of States (Majorization)

The bibliography contains manuscripts/papers/books from Leipzig and is supplemented with manuscripts/papers/books by J. Kerstan, A. Mead and E. Ruch et al, W. Thirring and A. Wehrl.

- [1] P. M. Alberti. Über einen speziellen Typ von Halbordnung im Zustandsraum eines Typ- I_{\aleph_0} -Faktors. *PhD thesis*, Sektion Physik, Universität Leipzig, 1973.
- [2] P. M. Alberti. Ein Theorem über die Vergleichbarkeit von Orthoprojektoren in abzählbar zerlegbaren W^* -Algebren. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 26(2):131–136, 1977.
- [3] P. M. Alberti. Zur unitären Mischung von Zuständen über abzählbar zerlegbaren Faktoren. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 26(2):123–129, 1977.
- [4] P. M. Alberti. Remarks on the \sum -property for positive linear forms on W^* -algebras. In H. Baumgärtel, G. Laßner, A. Pietsch, and A. Uhlmann, editors, *Proceedings of the International Conference on Operator Algebras, Ideals, and Their Applications in Mathematical Physics, Leipzig 1977*, 154–156, Teubner-Verlag, Leipzig, 1978.
- [5] P. M. Alberti. On maximally unitarily mixed states on W^* -algebras. *Math. Nachr.*, 90:423–430, 1979.
- [6] P. M. Alberti. The \sum -property for positive linear forms on W^* -algebras and its application to the problem of unitary mixing in the state space. *Math. Nachr.*, 90:7–20, 1979.
- [7] P. M. Alberti. Zur Ordnungsstruktur der Zustände im algebraischen Zugang zur Quantenstatistik. *Habilitation thesis*, Sektion Physik, Universität Leipzig, 1979.
- [8] P. M. Alberti. Fortsetzungssätze für Markov'sche Halbgruppen stochastischer und spurerhaltender linearer Abbildungen über Matrixalgebren. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 29(4):393–400, 1980.
- [9] P. M. Alberti. Wachsende Übergangswahrscheinlichkeiten und vollständig positive stochastische Transformationen. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 31(1):3–10, 1982.
- [10] P. M. Alberti. On the Simultaneous Transformation of Density Operators by Means of a Completely Positive, Unity Preserving Linear Map. *Publ. RIMS (Kyoto)*, 21:617–644, 1985.
- [11] P. M. Alberti. Vollständig positive Abbildungen und verallgemeinerte Übergangswahrscheinlichkeiten über atomaren W^* -Algebren. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 34(6):572–579, 1985.
- [12] P. M. Alberti. Completely Positive Linear Maps in a Concept of Majorization on Certain Operator Algebras. *Publ. RIMS (Kyoto)*, 22:1173–1189, 1986.
- [13] P. M. Alberti. Completely Positive Stochastic Linear Maps over AFD -Factors and Unitary Mixing on Generating U.H.F.-Subalgebras. *Publ. RIMS (Kyoto)*, 22:1105–1117, 1986.
- [14] P. M. Alberti. Convexity, unitary invariance and monotonicity under completely positive maps over injective von Neumann algebras. *Lett. Math. Phys.*, 12:249–256, 1986.
- [15] P. M. Alberti. The n -tuple Problem over Normal States on certain vN -algebras. In H. Michel, editor, *Proceedings of the International Conference on Ergodic Theory*

- and Related Topics, Georgenthal 1986*, 7–11. Teubner-Texte zur Mathematik 94. Teubner-Verlag, Leipzig, 1987.
- [16] P. M. Alberti. A note on stochastic operators on $L^1(X, m)$ -spaces and convex functions. *J. Math. Anal. Appl.*, 130:556–563, 1988.
 - [17] P. M. Alberti. Geometry of Completely Positive Maps over Certain Injective vN -Algebras and Applications to Transformation Problems. *NTZ-Preprint 28/1991*, Universität Leipzig, 1991.
 - [18] P. M. Alberti. Geometry of completely positive maps over certain injective vN -algebras. In M. Mathieu, editor, *Proceedings of the International Workshop on Elementary Operators and Applications, Blaubeuren 1991*, pages 117–141, World Scientific Publishers, Singapore-New Jersey-London-Hong Kong, 1992.
 - [19] P. M. Alberti. Transforming n -tuples of density operators by means of completely positive dynamical maps. (unpublished), 1994.
 - [20] P. M. Alberti and B. Crell. Anwendungen der Ordnungsstruktur beim Studium irreversibler Prozesse. In: Sitzungsberichte des Dresdner Seminars zur Theoretischen Physik, No.10, 1980.
 - [21] P. M. Alberti and B. Crell. Boltzmannähnliche Gleichungen und H -Theoreme. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 30(6):539–562, 1981.
 - [22] P. M. Alberti and B. Crell. Nichtlinearität und die H -Theoreme der Master-Gleichung. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 30(6):563–567, 1981.
 - [23] P. M. Alberti and B. Crell. Nonlinear evolution equations and H -theorems. *J. Stat. Phys.*, 35:131–149, 1984.
 - [24] P. M. Alberti and B. Crell. Zur Konvergenzgeschwindigkeit der Lösungen gewisser nichtlinearer Evolutionsgleichungen. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 34(6):583–587, 1985.
 - [25] P. M. Alberti and B. Crell. A note on the rate of convergence for certain nonlinear evolution equations. *Math. Meth. Appl. Sci.*, 8:479–491, 1986.
 - [26] P. M. Alberti, B. Crell, A. Uhlmann and C. Zylka. Order Structure (Majorization) and Irreversible Processes. To appear, 2006.
 - [27] P. M. Alberti and G. Kielau. Zur Dynamik im offenen quantenmechanischen n -Niveau System. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 33(1):32–45, 1984.
 - [28] P. M. Alberti and A. Uhlmann. The order structure of C^* - and W^* -algebras. In H. Baumgärtel, G. Laßner, A. Pietsch, and A. Uhlmann, editors, *Proceedings of the International Conference on Operator Algebras, Ideals and Their Applications in Mathematical Physics, Leipzig 1977*, 126–135. Teubner-Verlag, Leipzig, 1978.
 - [29] P. M. Alberti and A. Uhlmann. Existence and Density Theorems for Stochastic Maps on Commutative C^* -Algebras. *Math. Nachr.*, 97:279–295, 1980.
 - [30] P. M. Alberti and A. Uhlmann. A problem relating to positive linear maps on matrix algebras. *Rep. Math. Phys.*, 18:163–176, 1980.
 - [31] P. M. Alberti and A. Uhlmann. **Dissipative Motion in State Spaces**. Teubner-Texte zur Mathematik 33. Teubner-Verlag, Leipzig, 1981.
 - [32] P. M. Alberti and A. Uhlmann. Die Charakterisierung der Lösungen von Mastergleichungen, ein “inverses” Problem. *Ann. d. Phys. (Leipzig)*, 7(38):329–331, 1981.
 - [33] P. M. Alberti and A. Uhlmann. A note on stochastic dynamics in the state space of a commutative C^* -algebra. *J. Math. Phys.*, 22:2345–2351, 1981.
 - [34] P. M. Alberti and A. Uhlmann. **Stochasticity and Partial Order**. Deutscher Verlag d. Wissenschaften, Berlin, 1981.
 - [35] P. M. Alberti and A. Uhlmann. **Stochasticity and Partial Order—Doubly Stochastic Maps and Unitary Mixing**, *Mathematics and its Applications* 9. D.Reidel Publ. Company, Dordrecht-Boston-London, 1982.
 - [36] P. M. Alberti and A. Uhlmann. Stochastic linear maps and transition probability. *Lett. Math. Phys.*, 7:107–112, 1983.
 - [37] P. M. Alberti and A. Uhlmann. Transition Probabilities on W^* - and C^* - Algebras. In H. Baumgärtel, G. Laßner, A. Pietsch, and A. Uhlmann, editors, *Proceedings of the International Conference on Operator Algebras, Ideals, and Their Applications in Mathematical Physics, Leipzig 1984*, 5–11. Teubner-Texte zur Mathematik 67. Teubner-Verlag, Leipzig, 1984.

- [38] P. Busch and E. Ruch. The measure cone: irreversibility as a geometrical phenomenon. *Int. J. Quantum Chem.*, 41:163–185, 1992.
- [39] B. Crell, T. de Paly, and A. Uhlmann. *H*-Theoreme für die Fokker-Planck Gleichung. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 27(3):229–234, 1978.
- [40] B. Crell and A. Uhlmann. An example of a nonlinear evolution equation showing “chaos-enhancement”. *Lett. Math. Phys.*, 3:463, 1979.
- [41] B. Crell. Dissipative systems. *Suppl. Rend. Circ. Mat. di Palermo*, Serie II (6): 75, 1984.
- [42] B. Crell. Comment on anti-*H*-theorems in Markov processes. *Phys. Rev.*, A39:911, 1989.
- [43] B. Crell. A note on time evolutions satisfying anti-*H*-theorems. *Wiss. Beitr. MLU Halle*, 54:29, 1989.
- [44] B. Crell. On a class of kinetic equations for particles with discrete velocities. *Ann. d. Phys. (Leipzig)*, 47:413, 1990.
- [45] A. W. M. Dress, E. Ruch, and E. Triesch. Extremals of the cone of norms and the cohomology of c^3 -stratifications. *Adv. Appl. Math.*, 13:1–47, 1992.
- [46] J. Kästner and Ch. Zylka. On Generalized Uniformly Tapered Matrices. *Lin. Alg. Appl.*, 181: 221–232, 1993.
- [47] J. Kästner, A. Borobia, A. Dress, and Ch. Zylka. Extremal Majorizing and Anti-Majorizing Matrices. *Lin. Alg. Appl.*, 278: 133–145, 1998.
- [48] J. Kerstan. Evolutionsgleichungen mit *H*-Theoremen (unpublished manuscripts). Leipzig, Jena, 1981–1988.
- [49] G. Laßner and G.A. Laßner. On the time evolution of physical systems. *Publ. JINR Dubna*, E2-7537, 1973.
- [50] B. Lesche. A theorem on Ruch’s principle of nonequilibrium statistics. *J. Math. Phys.*, 17:427–430, 1976.
- [51] A. Mead. Generalizations of the Entropy Concept: Principles, Limitations and Prospects for Applications. *Adv. Chem. Phys.*, 51:113–175, 1982.
- [52] T. de Paly. Eine neue Klasse K- Entropie-ähnlicher Invarianten in der Ergodentheorie. *PhD thesis*, Sektion Physik, Universität Leipzig, 1980.
- [53] T. de Paly. On Entropy-like Invariants for Dynamical Systems. *Preprint KMU-QFT-1*, Karl-Marx-Universität Leipzig, 1980.
- [54] T. de Paly. On a Class of Generalized K-Entropies and Bernoulli Shifts. *Preprint KMU-QFT-3*, Karl-Marx-Universität Leipzig, 1980.
- [55] E. Ruch and A. Schönhofer. Theorie der Chiralitätsfunktionen. *Theoret. Chim. Acta*, 19:225–287, 1970.
- [56] E. Ruch. The Diagram Lattice as Structural Principle. *Theoret. Chim. Acta*, 38:167–183, 1975.
- [57] E. Ruch and A. Mead. The Principle of Increasing Mixing Charakter and Some of Its Consequences. *Theoret. Chim. Acta*, 41:95–117, 1976.
- [58] E. Ruch, R. Schranner, and T. H. Seligman. The mixing distance. *J. Chem. Phys.*, 69:386–392, 1978.
- [59] E. Ruch, R. Schranner, and T. H. Seligman. Generalization of a theorem by Hardy, Littlewood and Pólya. *J. Math. Anal. Appl.*, 76:222–229, 1980.
- [60] E. Ruch. Der Richtungsabstand. *Acta Appl. Math.*, 30:67–93, 1992.
- [61] E. Ruch and W. Stulpe. Proof of the mixing theorems for statistical systems in classical physics. *Acta Appl. Math.*, 53:329–352, 1998.
- [62] W. Thirring. *Lehrbuch der mathematischen Physik: Quantenmechanik großer Systeme*. Springer-Verlag, Wien, New York, 1980.
- [63] W. Thirring. *A Course in Mathematical Physics: Quantum Mechanics of Large Systems*. Springer-Verlag, Wien, New York, 1983.
- [64] W. Thirring. *Quantum Mathematical Physics: Atoms, Molecules and Large Systems*. Springer-Verlag, Berlin, New York, 2nd edition, 2002.
- [65] A. Uhlmann. On the Shannon Entropy and related Functionals on Convex Sets. *Rep. Math. Phys.*, 1:147–159, 1970.
- [66] A. Uhlmann. Sätze über Dichtematrizen. *Wiss. Z. Karl-Marx-Univ. Leipzig, Math.-Nat. R.*, 20:633–637, 1971.

- [67] A. Uhlmann. Endlich-dimensionale Dichtematrizen I . *Wiss. Z. Karl-Marx-Univ. Leipzig, Math.-Nat. R.*, 21:421–452, 1972.
- [68] A. Uhlmann. The Mixture of States. *Karpacz Winter School 1973*.
- [69] A. Uhlmann. Endlich-dimensionale Dichtematrizen II. *Wiss. Z. Karl-Marx-Univ. Leipzig, Math.-Nat. R.*, 22:139–177, 1973.
- [70] A. Uhlmann. Bericht über kürzlich bewiesene Entropieungleichungen. *Materialien der Arbeitstagung Statistische Physik der Phys. Ges.*, Leipzig 1974.
- [71] A. Uhlmann. Unitarily Invariant Convex Functions on the State Space of Type I and Type III von Neumann Algebras. *Rep. Math. Phys.*, 7:449–456, 1975.
- [72] A. Uhlmann. Zur Beschreibung irreversibler Quantenprozesse. *Sitzungsber. AdW DDR*, 14 N:1–25, 1976.
- [73] A. Uhlmann. Markov Master Equation and the Behaviour of some Entropy-like Quantities. In *Proc. Int. Coll. on the Role of Mathematical Physics in the Development of Science*. Unesco / College de France, Paris 1977, 160–171. (also: *Rostocker Physikalische Manuskripte*, Heft 2: 45–54, 1977.)
- [74] A. Uhlmann. Some Properties of Quantum Entropy. In *Proc. of the III-rd School of Elementary Particles and High Energy Physics*. Primorske, Bulgaria, 1977, 425–427.
- [75] A. Uhlmann. The Order Structure of States. In *Trudy Mezdunarodnowo Simpoziuma po Izbrannym Problemam Statisticeskoi Mechaniki*. Publ. JINR, D 17 - 11490, Dubna 1978, 151–161.
- [76] A. Uhlmann. Ordnungsstrukturen im Raume der gemischten Zustände und die H-Theoreme von Felderhof - van Kampen. *Wiss. Z. Karl-Marx-Univ. Leipzig, Math.-Nat. R.*, 27: 213–228, 1978.
- [77] A. Uhlmann. On Entropy in Quantum Statistics. In *Problems of Theoretical and Mathematical Physics*. Publ. JINR D-12831, Dubna 1979, 439–447.
- [78] A. Uhlmann. Remarks on the Relation between Quantum and Classical Entropy as Proposed by A. Wehrl. *Rep. Math. Phys.* 18: 177–182, 1980.
- [79] A. Uhlmann. On Stochastic Maps of C^* -Algebraic State Spaces. In *Ergodic Theory and Related Topics* (H. Michel ed.), Akademie-Verlag, Berlin 1982, 185–193.
- [80] A. Uhlmann. Eine Bemerkung über vollständig positive Abbildungen von Dichtoperatoren. *Wiss. Z. Karl-Marx-Univ. Leipzig, Math.-Naturwiss. R.* 34: 580–582, 1985.
- [81] A. Uhlmann. Algebra and Geometry in the Theory of Mixed States. In *Symmetry in Physics V*, B. Gruber (ed.), Plenum Publ. Corporation, New York 1991, 565–583.
- [82] A. Uhlmann. Simultaneous decompositions of two states. *Rep. Math. Phys.*, 46: 319–324, 2000.
- [83] A. Uhlmann. Zwischen Ordnung und Unordnung. *Leibniz Online* 3/2007 (Leibniz-Sozietät, Berlin).
- [84] A. Wehrl. How chaotic is a state of a quantum system? *Rep. Math. Phys.*, 6:15, 1974.
- [85] A. Wehrl. Dichtematrizen in Quantensystemen bei unendlicher Temperatur. *Acta Phys. Austriaca*, 41:197, 1975.
- [86] A. Wehrl. Basic properties of entropy in quantum mechanics. *Proceedings CIME Summer School on Statistical Mechanics*, Bressanone, 1976.
- [87] A. Wehrl. General properties of entropy. *Rev. Mod. Phys.*, 50:221, 1978.
- [88] A. Wehrl. Entropy in quantum mechanics and the order structure of states. *Proceedings of the International School "Recent Advances in Statistical Mechanics"*, Brasov, Romania, 1979.
- [89] A. Wehrl and W. Yourgrau. On the increase of entropy in the Carleman model. *Phys. Lett.*, A72:13, 1979.
- [90] A. Wehrl. On the increase of entropy in the Carleman model II. In A. van der Merwe, editor, *Essays in Honor of Wolfgang Yourgrau*. Plenum, New York, 1981.
- [91] A. Wehrl. Addendum to my Paper "How chaotic is a quantum state?". *Rep. Math. Phys.*, 20:401, 1984.
- [92] Ch. Zylka. Über stochastische Transformationen von Dichtematrix-Paaren. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 30: 568–571, 1981.

- [93] Ch. Zylka. Zur Erreichbarkeit von Zuständen bei Ausgleichsvorgängen. *PhD thesis*, Sektion Physik, Universität Leipzig, 1982.
- [94] Ch. Zylka. A note on the attainability of states by equalizing processes. *Theor. Chim. Acta*, 68: 363–377, 1985.
- [95] Ch. Zylka. Eine Verallgemeinerung des Satzes von Muirhead. *Wiss. Z. KMU Leipzig, Math.-Naturwiss. R.*, 34: 598–601, 1985.
- [96] Ch. Zylka. Zum Erreichbarkeitsproblem. *Ann. d. Physik (Leipzig)*, 44: 247–248, 1987.
- [97] Ch. Zylka. An Inequality for Partition Functions with Disturbed Hamiltonians. *J. Stat. Phys.*, 60: 281–284, 1990.
- [98] Ch. Zylka. Beiträge zur Thermodynamik und Statistik mittels Majorisierungs- und Wignertechniken. *Habilitation thesis*, Sektion Physik, Universität Leipzig, 1990.
- [99] Ch. Zylka. Über eine neue Halbordnung. *Leibniz Online* 3/2007 (Leibniz-Sozietät, Berlin).
- [100] Ch. Zylka and G. Vojta. Thermodynamic Proofs of Algebraic Inequalities. *Phys. Lett. A*, 152: 163–164, 1991.
- [101] Ch. Zylka and T. Tok. An Application of Majorization in Thermodynamics: An Analogue to the Adiabatic Demagnetization. *Physica A*, 188: 687–691, 1992.

Last update: April 13, 2007