

# HYPERNUMBERS AND OTHER EXOTIC STUFF



## (1) MORE ON THE "ARITHMETICAL" SIDE

Arborescent numbers: higher arithmetic operations and division trees - Henryk Trappmann

[http://eretrandre.org/rb/files/Trappmann2007\\_81.pdf](http://eretrandre.org/rb/files/Trappmann2007_81.pdf)

Tetration Reference - Henryk Trappmann and Andrew Robbins - <https://math.eretrandre.org/tetrationforum/attachment.php?aid=387>

Applications - <https://math.stackexchange.com/questions/199862/what-is-the-geometric-physical-or-other-meaning-of-the-tetration>

Publications - <https://math.eretrandre.org/publications.html>

Mathematics of tommy1729 - <https://math.eretrandre.org/tetrationforum/search.php?action=finduserthreads&uid=47>

Tetration.org, What Lies Beyond Exponentiation? - Daniel Geisler - <https://www.tetration.org/>

The family of arithmetics of Ruggero Maria Santilli - <http://www.santilli-foundation.org/docs/10.11648.j.ajmp.s.2015040501.14.pdf>

Isodual Theory of Antimatter with applications to Antigravity, Grand Unification and Cosmology

<https://www.amazon.com/Isodual-Theory-Antimatter-applications-Antigravity/dp/1402045174> (book)

Studies on Santilli's Isonumber Theory - Arun S. Muktidobh - <http://www.santilli-foundation.org/docs/pdf2.pdf>

Elements of Hadronic Mechanics III Experimental verifications - R.M.Santilli

<http://www.santilli-foundation.org/docs/elements-hadronic-mechanics-iii.compressed.pdf>

<http://thunder-energies.com/> && <http://www.santilli-foundation.org>

Foundations of Iso-Differential Calculus, Volume I - Svetlin G. Georgiev

<https://www.amazon.com/Foundations-Iso-differential-Calculus-Svetlin-Georgiev/dp/1685074774>

Trilogy of Numbers and Arithmetic Book 1 History of Numbers and Arithmetic: An Information Perspective - Mark Burgin

<https://www.amazon.com/Trilogy-Numbers-Arithmetic-Information-Perspective/dp/9811236836> (Non-diophantine Arithmetic !!!)

"What's inside ZerO?" 'Theta Numbers' and other possibilities within an 'Evolving-O' - John A. Shuster

[https://www.researchgate.net/publication/370924821\\_What's\\_inside\\_ZerO'\\_Theta\\_Numbers'\\_and\\_other\\_possibilities\\_within\\_an'\\_Evolving-O'](https://www.researchgate.net/publication/370924821_What's_inside_ZerO'_Theta_Numbers'_and_other_possibilities_within_an'_Evolving-O')

Saturation Arithmetic - [https://en.wikipedia.org/wiki/Saturation\\_arithmetic](https://en.wikipedia.org/wiki/Saturation_arithmetic)

Symmetric level index - [https://en.wikipedia.org/wiki/Symmetric\\_level-index\\_arithmetic](https://en.wikipedia.org/wiki/Symmetric_level-index_arithmetic)

A Hybrid Number Representation Scheme Based on Symmetric Level-Index Arithmetic Xunyang Shen and Peter R. Turner

[https://www.researchgate.net/publication/221142816\\_A\\_Hybrid\\_Number\\_Representation\\_Scheme\\_Based\\_on\\_Symmetric\\_Level-Index\\_Arithmetic](https://www.researchgate.net/publication/221142816_A_Hybrid_Number_Representation_Scheme_Based_on_Symmetric_Level-Index_Arithmetic)

Durfee square - [https://en.wikipedia.org/wiki/Durfee\\_square](https://en.wikipedia.org/wiki/Durfee_square)

The Magic & Joy of Exploding Dots - Kiran Ananthpur Bacche

<https://www.amazon.com/Magic-Joy-Exploding-Dots-revolutionary/dp/9388459113>

The operation of caret / exponentiation (new!) via multisets - <https://www.youtube.com/watch?v=TqKacqHS-fA>

ZEA A zero-free exact arithmetic - Dominique Michelucci and Jean-Michel Moreau

[https://www.researchgate.net/publication/220991026\\_ZEA\\_-\\_A\\_zero-free\\_exact\\_arithmetic](https://www.researchgate.net/publication/220991026_ZEA_-_A_zero-free_exact_arithmetic)

On quantum state of numbers - Bernard Le Stum & Adolfo Quirós - <https://arxiv.org/pdf/1310.8143.pdf>

Half-exponential function - [https://en.wikipedia.org/wiki/Half-exponential\\_function](https://en.wikipedia.org/wiki/Half-exponential_function)

Matrix exponential - [https://en.wikipedia.org/wiki/Matrix\\_exponential](https://en.wikipedia.org/wiki/Matrix_exponential)

Baker–Campbell–Hausdorff formula - [https://en.wikipedia.org/wiki/Baker%E2%80%93Campbell%E2%80%93Hausdorff\\_formula](https://en.wikipedia.org/wiki/Baker%E2%80%93Campbell%E2%80%93Hausdorff_formula)

The Unwinding Number - Robert M. Corless and David J. Jeffrey - <https://faculty.e-ce.uth.gr/akritas/CE102/p28-corless.pdf>

Distributive property examples - [https://en.wikipedia.org/wiki/Distributive\\_property#Other\\_examples](https://en.wikipedia.org/wiki/Distributive_property#Other_examples)

A new arithmetic function of combinatorial significance - Solomon W Golomb - <https://core.ac.uk/reader/82660399>

A Noncommutative Version of the Natural Numbers - Tyler Foster - <https://arxiv.org/pdf/1003.2081.pdf>

Multigrade and dividate: two new arithmetic operations - Eduard Kleihorst - <https://ieeexplore.ieee.org/document/833601>

A new number system: Remainder numbers

<https://math.stackexchange.com/questions/2415896/a-new-number-system-remainder-numbers>

Cantor's Attic (comprehensive resource of information about all notions of mathematical infinity)

[https://web.archive.org/web/20210803201055/http://cantorsattic.info/Cantor's\\_Attic](https://web.archive.org/web/20210803201055/http://cantorsattic.info/Cantor's_Attic)

Generalization of the unit interval - William M. Cornette - [https://projecteuclid.org/download/pdf\\_1/euclid.pjm/1102818012](https://projecteuclid.org/download/pdf_1/euclid.pjm/1102818012)

Construction, properties and applications of finite neofield - Anthony Donald Keedwell

[https://dml.cz/bitstream/handle/10338.dmlcz/119164/CommentatMathUnivCarolRetro\\_41-2000-2\\_8.pdf](https://dml.cz/bitstream/handle/10338.dmlcz/119164/CommentatMathUnivCarolRetro_41-2000-2_8.pdf)

Transnational numbers as an abstract data type - Jan A. Bergstra and John V. Tucker

<https://transmathematica.org/index.php/journal/article/view/47/31>

Hitting time - [https://en.wikipedia.org/wiki/Hitting\\_time](https://en.wikipedia.org/wiki/Hitting_time)

A new and improved number zero in an extended number system - Jonathan Cender

[https://www.academia.edu/40229488/A\\_NEW\\_AND\\_IMPROVED\\_NUMBER\\_ZERO\\_IN\\_AN\\_EXTENDED\\_NUMBER\\_SYSTEM](https://www.academia.edu/40229488/A_NEW_AND_IMPROVED_NUMBER_ZERO_IN_AN_EXTENDED_NUMBER_SYSTEM)

Sunyata Inspires a New Zero - Jonathan Cender

[https://www.researchgate.net/publication/336055749\\_Sunyata\\_Inspires\\_a\\_New\\_Zero](https://www.researchgate.net/publication/336055749_Sunyata_Inspires_a_New_Zero)

Quantity calculus - [https://en.wikipedia.org/wiki/Quantity\\_calculus](https://en.wikipedia.org/wiki/Quantity_calculus)

<http://ingvar.web03.cefit.se/wp-content/uploads/2016/02/physics6.pdf>

Metrological Thinking Needs the Notions of Parametric Quantities, Units, and Dimensions - Ingvar Johansson

List of humorous units of measurement - [https://en.wikipedia.org/wiki/List\\_of\\_humorous\\_units\\_of\\_measurement](https://en.wikipedia.org/wiki/List_of_humorous_units_of_measurement)

Dimensionless Physical Quantities in Science and Engineering - Josef Kuneš

<https://www.amazon.com/Dimensionless-Physical-Quantities-Engineering-Elsevier/dp/0124160131>

Frink - <https://frinklang.org/>

S. V. Gupta - Units of Measurement History, Fundamentals and Redefining the SI Base Units

<https://www.amazon.com/Units-Measurement-Fundamentals-Redefining-Materials/dp/3030439682>

Steven A. Treese - History and Measurement of the Base and Derived Units

<https://www.amazon.com/History-Measurement-Derived-Springer-Technology-ebook/dp/B07D542F3X>

An Algebraic Geometric Approach to Separation of Variables - Konrad Schöbel

<https://www.amazon.com/Algebraic-Geometric-Approach-Separation-Variables-ebook/dp/B016W7QJ0E>

Almost Integer - <https://mathworld.wolfram.com/AlmostInteger.html>

Solving Cubic Equations with Curly Roots - Dan Kalman and Maurice Burke

<https://www.jstor.org/stable/10.5951/matteacher.108.5.0392?seq=1>

Fórmula Luderiana Racional para Extração de Raízes Cúbicas - Ludenir Santos

<http://professorwaltertadeu.mat.br/FormulaLuderiana.pdf>

Tales of Mathematicians and Physicists - Simon Gindikin (cubic equation)

<https://www.amazon.com/Tales-Mathematicians-Physicists-Simon-Gindikin/dp/0387360263>

The Unattainable Attempt to Avoid the Casus Irreducibilis for Cubic Equations Gerolamo Cardano's De Regula Aliza - Sara Confalonieri

<https://www.amazon.com/Unattainable-Attempt-Avoid-Irreducibilis-Equations/dp/3658092742>

Niccolò Tartaglia's poetic solution to the cubic equation - Arielle Saiber

[https://www.academia.edu/7697619/Niccol%C3%B2\\_Tartaglias\\_Poetic\\_Solution\\_to\\_the\\_Cubic\\_Equation\\_link](https://www.academia.edu/7697619/Niccol%C3%B2_Tartaglias_Poetic_Solution_to_the_Cubic_Equation_link)

Computational complexity of mathematical operations

[https://en.wikipedia.org/wiki/Computational\\_complexity\\_of\\_mathematical\\_operations](https://en.wikipedia.org/wiki/Computational_complexity_of_mathematical_operations)

Radical of an integer - [https://en.wikipedia.org/wiki/Radical\\_of\\_an\\_integer](https://en.wikipedia.org/wiki/Radical_of_an_integer)

Integer square root - [https://en.wikipedia.org/wiki/Integer\\_square\\_root](https://en.wikipedia.org/wiki/Integer_square_root)

Quadratic residue - [https://en.wikipedia.org/wiki/Quadratic\\_residue](https://en.wikipedia.org/wiki/Quadratic_residue)

Hypernumbers and Extrafunctions: Extending the Classical Calculus - Mark Burgin

<https://www.amazon.com/Hypernumbers-Extrafunctions-Extending-SpringerBriefs-Mathematics/dp/1441998748>

Exponentiation by squaring - [https://en.wikipedia.org/wiki/Exponentiation\\_by\\_squaring](https://en.wikipedia.org/wiki/Exponentiation_by_squaring)

Addition-chain exponentiation - [https://en.wikipedia.org/wiki/Addition-chain\\_exponentiation](https://en.wikipedia.org/wiki/Addition-chain_exponentiation)

Egyptian fraction - [https://en.wikipedia.org/wiki/Egyptian\\_fraction](https://en.wikipedia.org/wiki/Egyptian_fraction)

Numerical Polynomial Algebra - Hans Jörg Stetter ( arithmetic pseudo-operations, look the chapter on 'Floating-Point Arithmetic' )

<https://www.amazon.com/Numerical-Polynomial-Algebra-Hans-Stetter/dp/0898715571>

Ordinal number - [&& Mex - https://en.wikipedia.org/wiki/Mex\\_\(mathematics\)](https://en.wikipedia.org/wiki/Ordinal_number)

On Unconventional Division by Zero - Jakub Czajko

<http://www.worldscientificnews.com/wp-content/uploads/2018/04/WSN-99-2018-133-147.pdf>

Bouncing factorial - [https://googology.fandom.com/wiki/Bouncing\\_Factorial](https://googology.fandom.com/wiki/Bouncing_Factorial)

The Tower of Hanoi Myths and Maths - Andreas M. Hinz, Sandi Klavžar and Ciril Petr

<https://www.amazon.com/Tower-Hanoi-Myths-Maths/dp/3319737783>

Parallel operator - [https://en.wikipedia.org/wiki/Parallel\\_\(operator\)](https://en.wikipedia.org/wiki/Parallel_(operator))

Calculating Instruments and Machines - Douglas R. Hartree - <https://archive.org/details/calculatinginstr00doug>

Reckoning with Matter Calculating Machines, Innovation, and Thinking About Thinking from Pascal to Babbage - Matthew L. Jones  
<https://www.amazon.com/Reckoning-Matter-Calculating-Machines-Innovation/dp/022641146X>

Fractions in transreal arithmetic - Jan A. Bregstra - <https://transmathematica.org/index.php/journal/article/view/19/23>

Derangement - <https://en.wikipedia.org/wiki/Derangement>

Finite Element Concepts A Closed-Form Algebraic Development - Gautam Dasgupta

<https://www.amazon.com/Finite-Element-Concepts-Closed-Form-Development/dp/1493984810>

Superpermutation - <https://en.wikipedia.org/wiki/Superpermutation>

A lower bound on the length of the shortest superpattern - Anonymous 4chan Poster, Robin Houston, Jay Pantone, and Vince Vatter  
<https://oeis.org/A180632/a180632.pdf>

Prime Numbers A Computational Perspective - Richard Crandall and Carl Pomerance  
<https://www.amazon.com/Prime-Numbers-Computational-Richard-Crandall/dp/0387252827>

MatheMagics for our eartHeart - John A. Shuster - [https://www.researchgate.net/publication/362887947\\_MatheMagics\\_for\\_our\\_eartHeart](https://www.researchgate.net/publication/362887947_MatheMagics_for_our_eartHeart)

International Journal of Division by Zero Calculus - <https://romapub.com/dbzc-vol-1--2021.php>

Introduction to the Division by Zero Calculus - Saburou Saitoh

<https://www.scirp.org/book/detailedinfoforabook.aspx?bookid=2746>

Däumler's conformal mapping - <https://www.horntorus.com/manifolds/conformal.html>

Morphosemantic Number: From Kiowa Noun Classes to UG Number Features - Daniel Harbour

<https://www.amazon.com/Morphosemantic-Number-Features-Language-Linguistic/dp/1402050399>

The Story of Zero - Talmi Givón - <https://www.amazon.com/Story-Zero-T-Giv%C3%A3n/dp/9027212392>

A Calculus of Number Based on Spatial Forms - Jeffrey M. James

<https://web.archive.org/web/20150629082522/http://www.Lawsofform.org/docs/jjames-thesis.txt>

Markov number - [https://en.wikipedia.org/wiki/Markov\\_number](https://en.wikipedia.org/wiki/Markov_number)

Integer Part - <https://mathworld.wolfram.com/IntegerPart.html>

Standard part function - [https://en.wikipedia.org/wiki/Standard\\_part\\_function](https://en.wikipedia.org/wiki/Standard_part_function)

Continuum between addition, multiplication and exponentiation

<https://math.stackexchange.com/questions/1269643/continuum-between-addition-multiplication-and-exponentiation>

The quartic equation: alignment with an equivalent tetrahedron - R. W. D. Nickalls

<http://www.nickalls.org/dick/papers/math/tetrahedron2012.pdf>

Radical Denesting - Kaan Dokmeci - <https://math.mit.edu/research/highschool/primes/materials/2017/conf/8-2-Dokmeci.pdf>

Generalized zero - [http://timescalewiki.org/index.php/Generalized\\_zero](http://timescalewiki.org/index.php/Generalized_zero) && <http://timescalewiki.org/index.php/Disconjugate>

Medoid - <https://en.wikipedia.org/wiki/Medoid>

Exceptional finite fields with distributive exponentiation - Jens Koeplinger and John A. Shuster

[https://www.researchgate.net/publication/368898811\\_Exceptional\\_finite\\_fields\\_with\\_distributive\\_exponentiation](https://www.researchgate.net/publication/368898811_Exceptional_finite_fields_with_distributive_exponentiation)

Zooming in on infinitesimal 1-9.. in a post-triumvirate era - Karin U. Katz and Mikhail G. Katz - <https://arxiv.org/pdf/1003.1501.pdf>

Ctrl+Shift+Enter: Mastering Excel Array Formulas - Mike Girvin

<https://www.amazon.com/Ctrl-Shift-Enter-Calculating-Excelisfun/dp/B011YT9AMO>

The Mathematics of Elections and Voting - W.D. Wallis

<https://www.amazon.com/Mathematics-Elections-Voting-W-D-Wallis/dp/3319098098>

Los misterios de la fracción prohibida - Claudi Alsina and Carme Burgués - <https://revistasuma.es/IMG/pdf/56/039-042.pdf>

Mediant - [https://en.wikipedia.org/wiki/Mediant\\_\(mathematics\)](https://en.wikipedia.org/wiki/Mediant_(mathematics)) and Ford circle - [https://en.wikipedia.org/wiki/Ford\\_circle](https://en.wikipedia.org/wiki/Ford_circle)

Question mark function - [https://en.wikipedia.org/wiki/Minkowski%27s\\_question-mark\\_function](https://en.wikipedia.org/wiki/Minkowski%27s_question-mark_function)

The fifth arithmetical operation - <https://numbervUSICrevolution.com/>

New Numerical Methods: The Rational Mean (book) - Domingo Gomez Morin (La quinta operación aritmética)

[https://www.amazon.com/gp/product/1520717245/ref=dbs\\_a\\_def\\_rwt\\_hsch\\_vapi\\_tpbk\\_p1\\_i1](https://www.amazon.com/gp/product/1520717245/ref=dbs_a_def_rwt_hsch_vapi_tpbk_p1_i1)

<https://www.youtube.com/watch?v=6lORU03yuvY>

AULOS. LA OTRA LUZ. Music and Consonance. New musical scale not based on the Octave.

[https://www.youtube.com/watch?v=gbK\\_V\\_7ivDA](https://www.youtube.com/watch?v=gbK_V_7ivDA)

<https://domingogomezmorin.wordpress.com/>

Topology of Numbers - Allen Hatcher - <https://pi.math.cornell.edu/~hatcher/TN/TNbook.pdf>

An introduction to the perplex number system - Jerry Chandler - <https://core.ac.uk/download/pdf/81127362.pdf>

Group Theory in Radar and Signal Processing - William Moran and Jonathan H. Manton

[https://link.springer.com/chapter/10.1007/978-3-319-12307-3\\_12](https://link.springer.com/chapter/10.1007/978-3-319-12307-3_12)

Mathematical Constants - Steven R. Finch

<https://www.amazon.com/Mathematical-Constants-Encyclopedia-Mathematics-Applications/dp/0521818052>

Dimensional Analysis Calculating Dosages Safely - Tracy Horntvedt

<https://www.amazon.com/Dimensional-Analysis-Calculating-Dosages-Safely/dp/0803661894>

Calculating Drug Dosages A Patient - Safe Approach to Nursing and Math - Sandra M. De Castillo and Maryanne Werner-McCullough  
<https://www.amazon.com/Calculating-Drug-Dosages-Patient-Safe-Approach/dp/0803624964>

Mathematical Tapas Volume I and II - Jean-Baptiste Hiriart-Urruty

Compression without a Common Prior: an Information-Theoretic Justification for Ambiguity in Language

Brendan Juba, Adam Tauman Kalai, Sanjeev Khanna and Madhu Sudan - <https://core.ac.uk/download/pdf/4426691.pdf>

The Art of Statistics: How to Learn from Data - David Spiegelhalter

<https://www.amazon.com/Art-Statistics-How-Learn-Data/dp/1541618513>

Show Me the numbers Designing Tables and Graphs to Enlighten - Stephen Few

<https://www.amazon.com>Show-Me-Numbers-Designing-Enlighten/dp/0970601972>

Alternative notation for exponents, logs and roots?

<https://math.stackexchange.com/questions/30046/alternative-notation-for-exponents-logs-and-roots>

Zero-dimensional commutative rings - David F. Anderson and David E. Dobbs

The arithmetic of Life and Death - George Shaffner - <https://www.amazon.com/Arithmetic-Life-Death-George-Shaffner/dp/0345426452>

Hypot - [https://en.wikipedia.org/wiki/Pythagorean\\_addition](https://en.wikipedia.org/wiki/Pythagorean_addition)

'Ortho-Addition' for Linearizing Quadratic Forms - John A. Shuster - ['Ortho-Addition' for Linearizing Quadratic Forms defined on the complex axes and the complexes](https://www.researchgate.net/publication/362887810)

Where Are Limits Needed in Calculus? - R. Michael Range - <https://www.jstor.org/stable/10.4169/amer.math.monthly.118.05.404>

abc Conjecture and New Mathematics - Fumiharu Kato - <https://www.youtube.com/watch?v=fNS7N04DLAQ>

Algebraic Theory for True Concurrency - Yong Wang

<https://www.amazon.com/Algebraic-Theory-True-Concurrency-Yong/dp/0443189129>

Yitang Zhang Landau-Siegel Zeros Conjecture - <https://www.youtube.com/watch?v=LIPDXWlHQ6Y>

Discrete mean estimates and the Landau-Siegel zero - <https://arxiv.org/pdf/2211.02515.pdf>

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Schnirelmann density - [https://en.wikipedia.org/wiki/Schnirelmann\\_density](https://en.wikipedia.org/wiki/Schnirelmann_density)

Super omega - [https://en.wikipedia.org/wiki/Chaitin%27s\\_constant#Super\\_Omega](https://en.wikipedia.org/wiki/Chaitin%27s_constant#Super_Omega)

A family of meta-Fibonacci sequences defined by variable order recursions - Nathaniel D. Emerson  
<https://arxiv.org/pdf/math/0508522v2.pdf>

On Hofstadter Heart Sequences - Altug Alkan, Nathan Fox and O.Ozgur Aybar  
<https://www.hindawi.com/journals/complexity/2017/2614163/>

Number reduction - [https://para.wiki/w/Number\\_reduction](https://para.wiki/w/Number_reduction)

The five fundamental operations of mathematics: addition, subtraction, multiplication, division, and modular forms - Kenneth A. Ribet - <https://math.berkeley.edu/~ribet/trinity.pdf>

Engel expansion - [https://en.wikipedia.org/wiki/Engel\\_expansion](https://en.wikipedia.org/wiki/Engel_expansion)

Dario Alpern's Web site - <https://www.alpertron.com.ar/ENGLISH.HTM>

Handbook of Continued Fractions for Special Functions - Annie Cuyt, Vigdis Brevik Petersen, Brigitte Verdonk, Haakon Waadeland and William B. Jones - <https://www.amazon.com/Handbook-Continued-Fractions-Special-Functions/dp/1402069480>

Geometry of Continued Fractions - Oleg N. Karpenkov  
<https://www.amazon.com/Continued-Fractions-Algorithms-Computation-Mathematics/dp/3662652765>

A novel operation associated with Gauss' arithmetic-geometric means - Shinji Tanimoto

<https://arxiv.org/pdf/0708.3521.pdf> ("intermediate operation" between addition and multiplication)

Arithmetic Geometric Mean - [https://en.wikipedia.org/wiki/Arithmetic%20-%20geometric\\_mean](https://en.wikipedia.org/wiki/Arithmetic%20-%20geometric_mean)

Gauss, Landen, Ramanujan, the Arithmetic-Geometric Mean, Ellipses,  $\pi$ , and the Ladies Diary

Gert Almkvist and Bruce Berndt - [https://link.springer.com/chapter/10.1007%2F978-3-319-32377-0\\_8](https://link.springer.com/chapter/10.1007%2F978-3-319-32377-0_8)

The total differential, the Cauchy-Riemann equations and the Elysian infinitesimals - Kerry Bemis

Arithmetic errors - <https://en.algorithmica.org/hpc/arithmetic/errors/>

Rounding to other values - [https://en.wikipedia.org/wiki/Rounding#Rounding\\_to\\_other\\_values](https://en.wikipedia.org/wiki/Rounding#Rounding_to_other_values)

The Mathematics of Errors - Nicolas Bouleau (see Chapter 6 'Error Structures')

<https://www.amazon.ca/Mathematics-Errors-Nicolas-Bouleau/dp/B0BT91JH3P>

TriINTERCAL - <https://esolangs.org/wiki/TriINTERCAL>

TrybblePusher - <https://esolangs.org/wiki/TrybblePusher>

Heinz mean - [https://en.wikipedia.org/wiki/Heinz\\_mean](https://en.wikipedia.org/wiki/Heinz_mean)

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Jacques Bair, Alexandre Borovik, Vladimir Kanovei, Mikhail G. Katz, Semen Kutateladze, Sam Sanders, David Sherry and Monica Ugaglia

Infinite compositions of analytic functions - [https://en.wikipedia.org/wiki/Infinite\\_compositions\\_of\\_analytic\\_functions](https://en.wikipedia.org/wiki/Infinite_compositions_of_analytic_functions)

The weird forest of "Big-Oh" asymptotics - <https://begriffs.com/posts/2013-12-17-the-weird-forest-of-big-oh-asymptotics.html>

When Less is More Visualizing Basic Inequalities - Claudi Alsina and Roger B. Nelsen  
<https://www.amazon.com/When-Less-More-Inequalities-Mathematical/dp/0883853426>

The wonder world of kaprekar numbers - R. Athmaraman (editor)

Multiplicative calculus - [https://en.wikipedia.org/wiki/Multiplicative\\_calculus](https://en.wikipedia.org/wiki/Multiplicative_calculus)

Subderivative - <https://en.wikipedia.org/wiki/Subderivative>

Fractal derivative - [https://en.wikipedia.org/wiki/Fractal\\_derivative](https://en.wikipedia.org/wiki/Fractal_derivative)

A Catalogue of Lattices - Gabriele Nebe and Neil Sloane - <http://www.math.rwth-aachen.de/~Gabriele.Nebe/LATTICES/>

A curious arithmetic of fractal dimension for polyadic Cantor sets - Francisco R. Villatoro - <https://arxiv.org/pdf/0910.5014.pdf>

Timothy Golden and Tersymmetrical Suppression Conspiracy - Tanaka  
[https://archive.org/details/tim\\_golden\\_and\\_tersymmetrical\\_suppression\\_conspiracy](https://archive.org/details/tim_golden_and_tersymmetrical_suppression_conspiracy)

Basic Gambling Mathematics: The Numbers Behind The Neon - Mark Bollman  
<https://www.amazon.com/Basic-Gambling-Mathematics-Mark-Bollman/dp/1482208938>

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## (9) SOFTWARE ZONE

DATA STRUCTURES\*

Treesheet (tree-like spreadsheet) - <http://strlen.com/treesheets/>  
Blockchain (demo) - <https://andersbrownworth.com/blockchain/>  
Heimer (mind map) - <https://github.com/juzzlin/heimer>  
DAS-UI <https://das-ui.firebaseioapp.com/> && <https://szymonkaliski.com/writing/2017-09-08-building-das-ui/>  
Orca (procedural sequencers) - <https://github.com/Hundredrabbits/Orca>  
Taichi (spatially sparse multi-level data structures) - <https://github.com/taichi-dev/taichi>  
Rasdaman (datacube and arrays) - <http://www.rasdaman.org/wiki>  
Categorical Data (data-related tasks using category theory) - <https://www.categoricaldata.net/>  
Enso (diagrammatic coding) - <https://enso.org/language>  
Egison (efficient non-linear pattern matching with backtracking for non-free data type) - <https://www.egison.org/>  
Eve (uniform data-processing) - <http://witheve.com/>  
Habit (type-level programming) - <https://www.habit-lang.org/>  
Fluidinfo (columnar shareable data) - <https://github.com/fluidinfo> && <https://en.wikipedia.org/wiki/Fluidinfo>  
MentDB (world wide Data) - [https://www.mentdb.org/mentdb\\_weak.html](https://www.mentdb.org/mentdb_weak.html)  
Obsidian (knowledge base on top of your local folder of plain text files) - <https://obsidian.md/>  
LMQL (query language for large language models) - <https://github.com/eth-sri/lmql>  
Koka (effect typing, effect handlers, Perceus memory management) - <https://koka-lang.github.io/koka/doc/book.html#why>  
NewLang (computing tensors and rational numbers) - <https://github.com/rsashka/newlang>  
Odin (data-oriented programming) - <https://odin-lang.org/>  
Cairo (provable programs and nondeterministic jumps) - [https://www.cairo-lang.org/docs/how\\_cairo\\_works/cairo\\_intro.html](https://www.cairo-lang.org/docs/how_cairo_works/cairo_intro.html)  
Exo (exocompilation) - <https://exo-lang.dev/>  
Primecoin - <https://en.wikipedia.org/wiki/Primecoin> && <https://primecoin.io/>

STRUCTS\* WITH META

Bedrock (meta-distro) <https://bedrocklinux.org/>  
Funtoo (meta-distro) - <https://www.funtoo.org/Welcome>  
T2 System Development Environment (meta-distro) - <https://t2sde.org/index.cgi>  
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Black (reflective) - <http://pllab.is.ocha.ac.jp/~asai/Black/>  
Terra (meta-programming) - <http://terralang.org/>  
MetaL (meta-language) - <https://www.meta-language.net/faq.html#what>  
Rinci (metadata specifications) - <https://metacpan.org/pod/Rinci#ABSTRACT>  
Circle (meta-programming) - <https://www.circle-lang.org/>  
Hackett (meta-programming) - <https://lexi-lambda.github.io/hackett/>  
Elena (polymorphic code) - <https://github.com/ELENA-LANG/elenalang/wiki/ELENA-Programming-Manual#overview>  
Beluga (mechanizing meta-theory) - <https://www.cs.mcgill.ca/~complogic/beluga/index.html>

Hazel (incomplete programs) - <https://hazel.org/>  
Autohotkey (gui and scripting automation for windows) - <https://www.autohotkey.com/>  
Rosie Pattern (beyond regex) - <https://rosie-lang.org/about/>  
Antipurity (self-aware interpreter) - <https://github.com/Antipurity/conceptual>  
Multicompiler (defensive compiler) - <https://immunant.com/blog/2018/09/multicompiler/>  
Avail (articulate programming) - <https://www.availlang.org/about-avail/introduction/index.html>  
Push (evolutionary computing) - <https://faculty.hampshire.edu/lspector/push.html>  
Wyvern (built-in skill for large-scale design) - <https://wyvernlang.github.io/>  
Gen (probabilistic) - <https://probcomp.github.io/Gen/>  
Pyro (probabilistic) - <https://pyro.ai/>  
Rascal (meta-programming) - <https://www.rascal-mpl.org/>  
Pharo (software as objects, immersive) - <https://pharo.org/features>  
DarklangGPT (Deployless cloud backends with AI-generated code) - <https://darklang.com/>  
LangChain (simplify APP construction with LLMs) - <https://langchain.com/>  
Scallop (neurosymbolic programming) - <https://scallop-lang.github.io/>  
Mojo (AI oriented) - <https://docs.modular.com/mojo/why-mojo.html>

#### SOUND\*

Gwion - <https://gwion.github.io/Gwion/>  
Kronos vesaronilo - <http://kronos.vesanorilo.com/>  
Supercollider - <https://supercollider.github.io/>  
Faust - <https://faust.grame.fr/>  
Chuck - <http://chuck.cs.princeton.edu/>

#### NETWORKING\*

Live Raizo (network simulation) - <https://sourceforge.net/projects/live-raizo/>  
P4 (implement specific network behaviours) - <https://p4.org/>  
Helena (browsing automation) - <https://helena-lang.org/>  
Volunia (rpg-like browser) <http://www.volunia.com/>  
Gather (rpg-like meetings) - <https://www.gather.town/>  
Lynx (textual browser) - [https://en.wikipedia.org/wiki/Lynx\\_\(web\\_browser\)](https://en.wikipedia.org/wiki/Lynx_(web_browser))  
Beaker Browser (peer-to-peer Web browser) - <https://beakerbrowser.com/>  
Nyxt browser (keyboard-driven browser) - <https://github.com/atlas-engineer/next>  
Jolie (microservices) - <https://www.jolie-lang.org/>  
Daphile (headless music server) - <https://www.daphile.com/>  
Skywave linux (software defined radio servers) - <https://skywavelinux.com/>  
Gotenna (off-grid mobile mesh) - <https://gotenna.com/>  
Manyverse (off-grid social networking) - <https://www.manyver.se/faq/what-is-manyverse>  
p2p networking - <https://www.gnunet.org/en/> <https://zeronet.io/> <https://freenetproject.org/>  
Eternal-september private news server (usenet) - <http://eternal-september.org/>  
Aioe.org public news server (usenet) - <https://news.aioe.org/>  
What is the Usenet improvement Project? - <http://twovoyagers.com/improve-usenet.org/>  
Fediverse (federated servers for web-publishing) - <https://en.wikipedia.org/wiki/Fediverse>  
Assemblyscript (a TypeScript-like language for WebAssembly) - <https://www.assemblyscript.org/>  
Buzz (swarms robotics) - <https://github.com/buzz-lang/Buzz> && <https://the.swarming.buzz/wiki/doku.php>  
Wing (entire cloud as the computer) - <https://github.com/winglang/wing>

#### OPERATING SYSTEM\*

XOD.IO (microcontrollers) - <https://xod.io/>  
Elemental Processor SIMulator - <https://wepsim.github.io/>  
Mikrocodesimulator MikroSim 2010 (microcode) - [http://www.mikrocodesimulator.de/index\\_eng.php](http://www.mikrocodesimulator.de/index_eng.php)  
Katai Struct (binary data structures) - <https://kaitai.io/>  
Snowdrop OS (16-Bit Operating System) - <http://sebastianmihai.com/snowdrop/>  
Turbo Rascal (design of 8-bit/16-bit games) - <https://lemonspawn.com/turbo-rascal-syntax-error-expected-but-begin/>  
NESFab (creating NES games) - <https://pubby.games/nesfab.html>  
Tunguska (a ternary computer emulator) - Viktor Lofgren - <http://tunguska.sourceforge.net/>  
The Trillium Architecture - Douglas W. Jones - <http://homepage.divms.uiowa.edu/~jones/ternary/trillium.shtml>  
Red (full-stack) - <https://www.red-lang.org/p/about.html>  
Racket - <https://racket-lang.org/> && Neverlang - <https://cazzola.di.unimi.it/neverlang2.html> (language creation)  
Rescatux - <https://www.supergrubdisk.org/rescatux/> && Parted Magic - <https://partedmagic.com/> (OSes for rescue and recovery)  
Minix - <https://www.minix3.org/> && ‘An Open Letter to Intel’ - <https://www.cs.vu.nl/~ast/intel/>  
Los Procesadores Intel tienen un Secreto Misterio - <https://www.youtube.com/watch?v=CaLb7waR6eo>  
Debian-hurd (debian over Hurd) - <https://www.debian.org/ports/hurd/> [https://en.wikipedia.org/wiki/GNU\\_Hurd](https://en.wikipedia.org/wiki/GNU_Hurd)  
Trisquel (ubuntu over Libre-Linux) - <https://trisquel.info/>  
Noulith (attempt to give myself a new Pareto-optimal choice for quick-and-dirty scripts) - <https://github.com/betaveros/noulith>

Ratpoison (Window Manager) - <https://www.nongnu.org/ratpoison/>  
IceWM (Window Manager) - <https://ice-wm.org/>  
RedoxOS - <https://doc.redox-os.org/book/ch01-06-how-redox-compares.html>  
Linux From Scratch! - <https://www.linuxfromscratch.org/>

#### LANGUAGE\*

Sono (linguistic study) - <https://github.com/Nallantli/Sono>  
Quorum (evidence-oriented) - <https://quorumlanguage.com/reference.html>  
Inform7 (interactive narrative, textual adventures) - <http://inform7.com/>  
Poliqarp (universal concordancer for large corpora) - <http://poliqarp.sourceforge.net/about.html>  
Paper generator - [https://en.wikipedia.org/wiki/Paper\\_generator](https://en.wikipedia.org/wiki/Paper_generator)  
Markup Languages list - <https://web.mit.edu/mecheng/pml/standards.htm>  
Hedy (multi-lingual, teaching) - <https://hedy.org/>

#### GRAPHICS\*

Curv (mathematical methods for art design)- <https://github.com/curv3d/curv>  
GraRLS (static graphic images) - <http://www.grarls.org/>  
KUIML (skin and GUI) - <https://www.bluecataudio.com/Vault/Skins/KUIML/>  
Complexities of Color in Computing - Ellen Wondra - <https://www.youtube.com/watch?v=VCvOwoeOgv8>  
Dr Huang's Math Handbook Calculator - <http://drhuang.com/> && <http://drhuang.com/science/mathematics/software/>  
Draw2D (diagrams) - <http://www.draw2d.org/draw2d/examples.html>  
Threejs (creation of 3D content) - <https://threejs.org/manual/#en/fundamentals>  
Video (video editing) - <https://lang.video/>  
SciLab (numerical computation) - <https://www.scilab.org/>  
to line 187 move to second document <https://zglang.org/learn/overview/> <https://github.com/grain-lang/grain>

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<https://www.amazon.com/Diagnosing-System-Organizations-Stafford-Beer/dp/0471951366>  
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<https://www.amazon.com/Beyond-Dispute-Invention-Team-Syntegrity/dp/0471944513>  
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How Many Grapes Went Into the Wine - Stafford Beer (see chapter 'The Irrelevance of Automation')  
<https://www.amazon.com/Many-Grapes-Went-into-Wine/dp/0471942960>

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RBE TVP research center mix - <https://www.youtube.com/watch?v=Jy967Y0OsWY>

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Peter Joseph 's podcast <https://www.youtube.com/@RevolutionNowPodcast>

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SUPL (Syntactic Universal Programming Language): a new dimension in software design and artificial intelligence  
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Cybernetics today and tomorrow: The place of hypernumbers

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Chris Langan on IQ, The Singularity, Free Will, Psychedelics, CTMU, and God - <https://www.youtube.com/watch?v=N-bRM1kYuNA>  
CTMU Wiki - <https://ctmucommunity.org/wiki/> && CTMU Papers <http://hology.org/ctmu-papers/>  
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<https://www.amazon.com/Disturbed-Consciousness-Psychopathology-Theories-Philosophical-ebook/dp/B08BSZRZF7>

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Beyond Smarter Mediated Learning and the Brain's Capacity for Change - Reuven Feuerstein, Rafael S. Feuerstein and Louis H. Falik

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Numerical cognition - [https://en.wikipedia.org/wiki/Numerical\\_cognition](https://en.wikipedia.org/wiki/Numerical_cognition)

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