Joint Math Meetings, Seattle, 2016, Report

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College of the Desert

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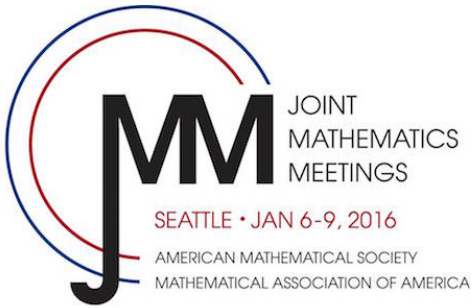


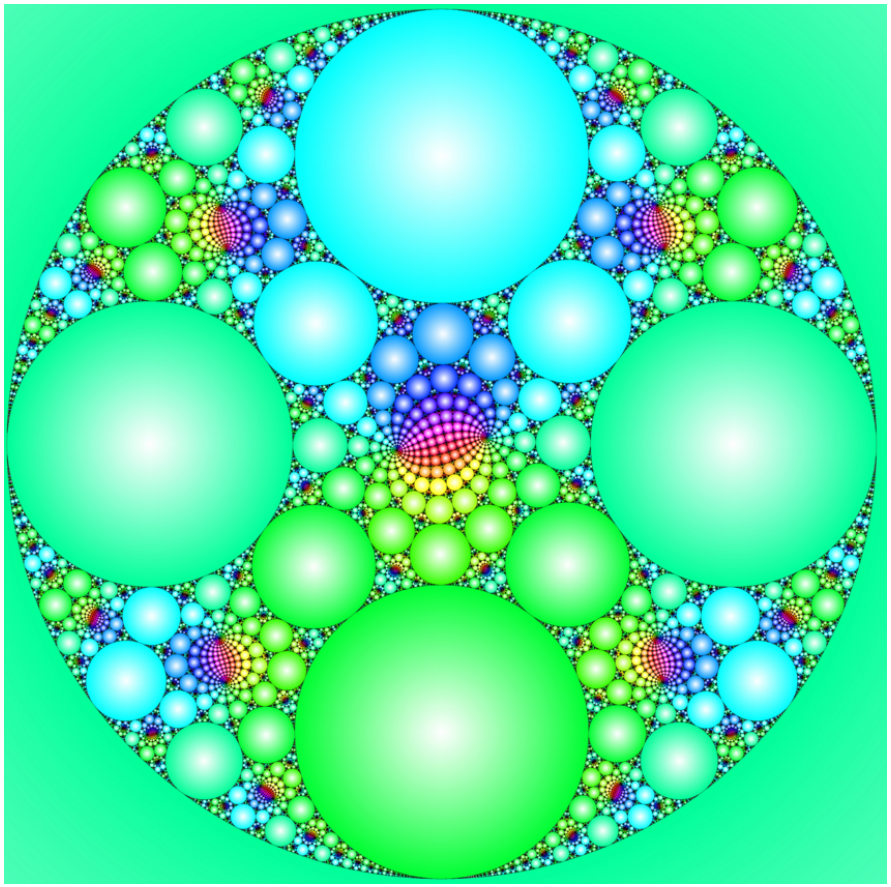
A Sampling of Sessions

Wednesday Sessions

- In the General Contributed Paper Session on Graph Theory
  - *Smith and Critical Groups of the Rook's Graph and its Complement* was presented by Jonathan Gerhard
  - *Structure of self-Complementary graphs* by Peter Maceli
  - *Forestable Graphs* by Neal Bushaw of ASU
- AMS-MAA Invited Address: *Statistical paradises and paradoxes in big data* - Xiao-Li Meng, Harvard
- AMS Special Session on Origami Methods and Applications II
  - *Computational Origami is hard*, by Erik D. Demaine, MIT. Also, Maze folding
  - Zachary Abel asked Who needs crossings?
  - Efficient Origami Design MIT Open Courseware
  - *Geometric Folding Algorithms linkages, Origami, Polyhedra*
  - Jun Mitani did Verification of flat-foldability of crease patterns on the 45 degree grid system.
  - Jason Ku spoke on *Generating Crease Patterns from Prescribed Boundary Foldings*
  - John Bowers on Geodesic Universal Molecules with Ileana Streinu
  - Robert Lang spoke on *Counterrotating Twist Tessellations and Brocard Polygons*

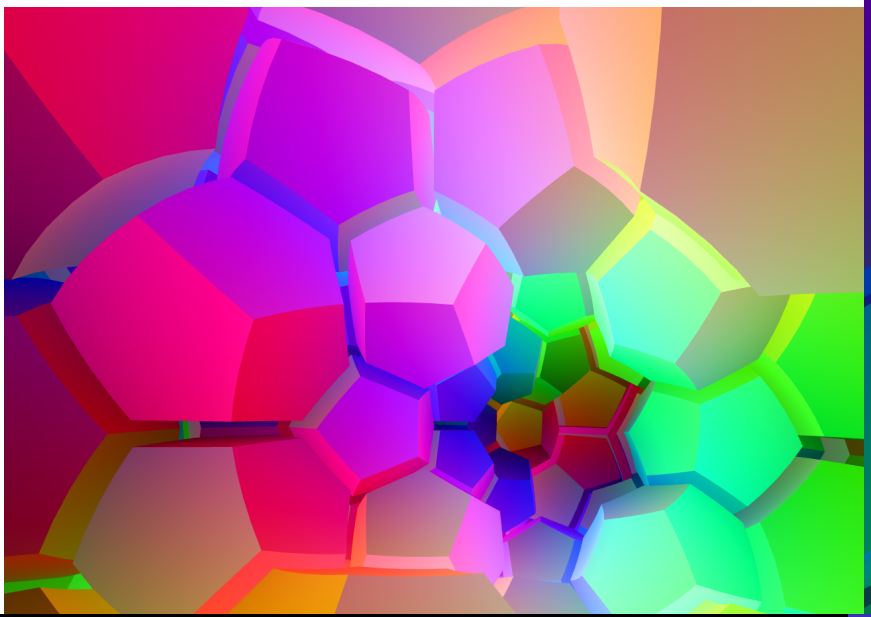
Indra's Pearls

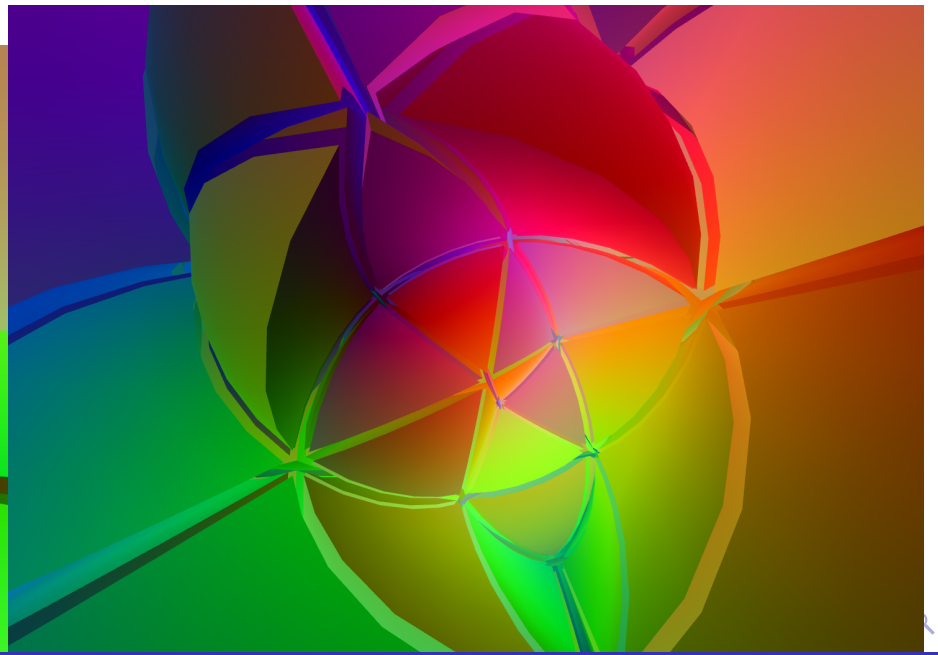
I caught Carter Murray's talk: The Orbits of Various Möbius Mappings, which featured explorations of ideas in the book, Indra's Pearls, by Mumford, where the Möbius transformation of a complex variable z defined by $f(z) = \frac{az+b}{cz+d}$ with $a, b, c, d \in \mathbb{C}$ and $ad - bc \neq 0$. These transformations form a group and map the Riemann sphere to itself in a way that sends circles to circles and preserves angles abetween circles that intersect. These mappings can be iterated to produce further mappings and if the orbit of such iterated mappings are projected onto the plane, pretty pictures like the one at right emerge.



What I missed on Wednesday

It was pretty difficult to figure out what the heck to attend at this conference. I was pretty disoriented at first and missed that in the Wednesday afternoon MAA Session on Mathematics and the Arts, II, Vi Hart and Andrea Hawksley of the Communications Design Group, SAP Labs would talk on Hypernom. This is a virtual reality (VR) game involving the exploration of a 4-dimensional space. They have a paper describing it. It rests on a one-to-one mapping between the unit quaternions and points on S^3, the hypersphere in 4 dimensions. It seems "nom" is the sound of a hungry hyperpoly eater eating a hyperpoly...also, hyperbolic crochet?





Thursday Sessions

- In the History of Mathematics Vorstellungskraft without sensory media: Jakob Steiner and the figure in geometry was presented by Jemma Lorenat, who teaches at Pitzer.
- AMS Special Session - Mathematical Information in the Digital Age
  - Thomas Hales, UPitt, spoke on Formal Proof
  - Bruno Buchberger, of the Research Institute for Symbolic Computations at Johannes Kepler University, Austria, spoke on Theorema, a software for proving theorems.
  - Michael Shulman of UCSD spoke on From the nLab to the HoTT Book which is an astounding accomplishment! HoTT stands for Homotopy Type Theory...check it out!
- Raymnond N. Greenwell of Hofstra University spoke on A Calculus Class Focusing on New Applications
- Patricia Baggett reported on *A mathematically rigorous calculus course in a laboratory format for undergraduate and graduate non-math majors*
- Luke Wolcott of Lawrence University spoke on a philosophy/math website he created, gardensofinfinity.com.

Thursday Sessions in Recreational Math

- MAA Session on Recreational Mathematics: Puzzles, Card Tricks, Games, Game Shows and Gambling
  - Darren Glass of Gettysburg College spoke on the mathematics of Chutes and Ladders which, while a really boring game to play (Strategy: "roll well") has interesting mathematical analyses and is fairly easy to implement in C++ or Java.
  - Jathan Austin of Salisbury University presented a paper that appeared in a recent CMJ, *Settlers of Catan*.
  - Sullivan, Townsend spoke on Cops and Robbers.
  - Heilman, Sprague presented Grime Dice and the Archbishop involving Efron dice and other non-transitive dice.
  - Edgar and Sklar spoke on *The Confused Electrician*, kind of a genre
  - Bruce Torrence spoke about a curious game LCR involving Fibonacci and Lucas numbers.
  - Oscar Levin presented his paper on *Knights and Knaves* He's got an open source Discrete Math text.

Friday

- William Kronholm spoke on *Using Integration by the Wrong Parts*
- MAA Invited Address, What makes for powerful classrooms–and what can we do, now that we know?, where Alan Schoenfield of UCB spoke about the TRU Framework and the Math Assessment Program–great stuff!
- Mei May talked about Heights of Happy Numbers followed by
- Generalized Happy Functions–hooray !
- Lila Roberts spoke on Demos With Positive Impact

Saturday

- John Thoo described his experience using the History of Math in community college algebra courses.
- Cynthia J. Huffman of Pittsburg State University described her research into *Ars Magna* digitized at Linda Hall Library. Lots of cool digitized original sources available there.
- Amy Shell-Gellasch talked on Physical models of binomial expansion and completing the square. She and John Thoo coauthored a new text, Algebra in Context.
- David Pengelley, who I remember from his contribution to the calculus reform movement some 20+ years ago, is leading a movement at New Mexico State University to Throw away the textbook: teaching discrete mathematics from primary historical sources. They have put together a nice Repository of projects, especially discrete math projects