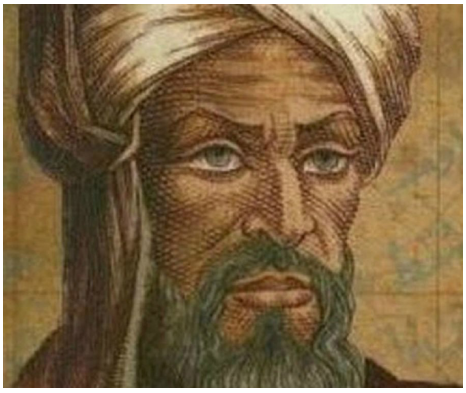
The √Radical

Mondays @ 5PM ▪ Lockett Hall 3rd Floor Lounge
October 17, 2016

Mathematician of the Week: Muḥammad ibn Mūsā al-Khwārizmī



Depiction of Muḥammad ibn Mūsā al-Khwārizmī
Courtesy of The Famous People

A Persian polymath, Muḥammad ibn Mūsā al-Khwārizmī helped bridge the gap from the geometric mathematics of the ancient Greeks to a more abstract style of algebra.

His intellectual thrust was formed of three components: the first, that he adapted the concrete system of lengths and measures to one which incorporated numbers, both rational and irrational, along with geometric quantities as "algebraic objects."

The second, that rather than following the older style of Babylonian mathematical tablets, which would list, say, Pythagorean triples or other specific examples of a more general theory, he laid out a method for solving whatever kinds of equations a mathematician would come across.

Finally, that he diffused novel notation in his writings; although Fibonacci is credited for introducing the Hindu-Arabic numeral system to Europe, he would not have had nearly the access to it if al-Khwārizmī had not first spread it through the Middle East.

Al-Khwārizmī referred to the operation of cancelling negative terms in an equation by adding the positive quantity to each side as "restoration," or "al-jabr," giving rise to the word "algebra." Likewise, as his work gave a series of steps to solve equations, his name itself is the origin of our "algorithm."

Algebra and Number Theory Seminar

Xingting Wang, Temple University
Tuesday, October 18 @ 3:30PM
Lockett 284

Topic: Quantum groups associated to a pair of preregular forms

Topology Seminar

Rafal Komendarczyk, Tulane University
Thursday, October 19 @ 3:30PM
Lockett 233

Topics: Ropelength, crossing number and finite-type invariants

Suggestions of the Week:

Those who are interested in a career in academia should try to obtain research in their undergraduate years. This will prepare them for more substantial work in grad school.

Your Math Club Mascot,
Aaron Cao

Next semester's course offerings are out, so make a grocery list of courses you'd like to take before you see your adviser.

Your Math Club President,
Chand The Man

For parties interested in academia, make sure you prepare for your interviews extra well.
Courtesy of Mathematical Mathematics Memes

Check us out at:

Q&A with James Madden

Chandler McArthur: If you could collaborate with any mathematician, who would it be and why?

James Madden: Oh, my goodness. Well, I would like to talk to Gauss. I bet you he's the person that everybody mentions. But, collaborate? I don't think I'd collaborate with Gauss because what would take me two days to do he might do in ten minutes. Descartes would be an interesting person to talk to, and any Greek mathematician. Of course, it would take years to bridge the culture. The obstacle to collaborating even with people who are alive and not very far from here is it takes a long, long time before two people have enough ideas in common to begin profiting from one another's presence. So when you say "collaborate with," right, here's the thing -- there's no mathematician living or dead who I *couldn't* collaborate with. And I wouldn't even need any magic to do it! All I would need is access to their writings — and I'm collaborating with them!

CM: How did you settle into your mathematical niche and how long did it take you to realize you were there?

JM: I didn't settle into a mathematical niche; I was forced against my will by circumstances into one, and I spent most of my career trying not to be in it. My niche is sort of the more foundational and logical aspects of topological and algebraic structures. My aspiration was to work in real algebraic geometry, which I did to some extent, but the problems I wanted to solve there are still unsolved despite the fact that dozens of people have tackled them. Where I wandered was statistics. I've never published anything in statistics, but I think a lot and do a lot with displaying information. The statistics that I know is very important.

CM: Lastly, if you could change one thing you did or didn't do as a young mathematician, what would it be?

JM: Not be a jerk! Not being a jerk is a lifelong struggle. Mathematically, my biggest mistake was not to realize how much work it took to have a good idea. Another big mistake was to be intimidated by people that were faster than me. Of course it was reasonable for me to be intimidated by people who were faster than me if I didn't have the *guts* to do the work that was needed, but I didn't even realize that it *took* guts to do the necessary work. So, my biggest regret is not realizing when I was 18 that I actually wanted to work my butt off; I thought I wanted to chase rainbows then.

James Madden, co-director of the Cain Center, director of the LAMSTI program, and professor of mathematics

Courtesy of LSU Gold

That's my biggest regret, and that's an important idea for anybody who's less than 50 years old to take into account; first of all, really understand what it means to do the work required, and that's not so easy, because when I was younger, in my 30's, I was beating my head against a wall with this difficult problem.

I didn't know how to get the knowledge needed in order to launch a reasonable attack on it and I don't think I realized that because I don't think I was around mathematicians that were good enough. I was around people that wanted to do their own thing, work on what they were good at, and I was trying to do something I was definitely not good at.

Now I think the really great mathematicians are people that try to do something that they aren't good at. Now don't get me wrong, these are people that were better at it than anybody else in the universe, but they just weren't good at it yet. Whatever mathematical problem you take, if you're good at it, it's not worth tackling. If there's nobody that's good at it, including you, then it might be a worthwhile endeavor.

Where the genius comes in with mathematicians is that these are people that know how to tackle something that is seemingly impossible for any mortal to be good at. They *become* good at dealing with the impossible. And if we could educate people to do that, then that would be a success for our education system.

Teaching people how to get a paper published — anybody can publish a paper. But teaching people how to deal with the impossible, and make it *not* impossible — how do you do that? Through history, there have been people like that: Oscar Zariski, Kepler, perhaps Fourier. Those are people that tackled the impossible.