

# NSF Career Submission

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# Background

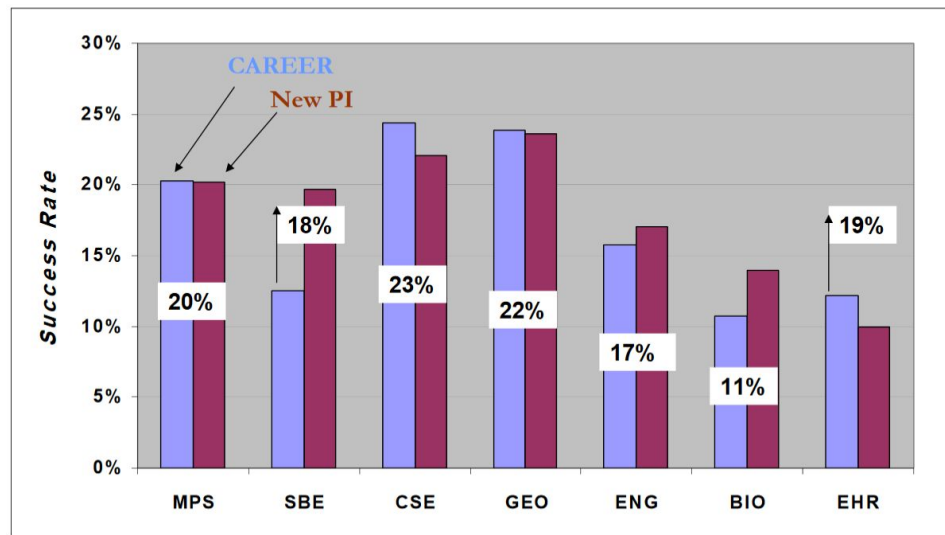
- Joined UofL in Fall 2015
- Attended NSF Career Workshop in April 2016
- Contacted Grant Office to prepare submission on April 11, 2016
- All documents in place on June 26th, 2016
  - Keep modifying until deadline (July 20th, 2016)
- Post-submission
  - Panel - late September, 2016
  - Intent to award email - early January, 2017
  - Awarded on April 1st 2017

# Funding Details

- **Funding Agency**
  - National Science Foundation (NSF)
- **Program Name**
  - Faculty Early Career Development Program (CAREER)
- **Eligibility**
  - Untenured faculty
  - Limited to 3 submissions
- **NSF's standard merit-review process including a panel**
- **Timeline**
  - Jul. - submission
  - Sep. - panel
  - Jan. - notification
  - Jan/Feb - requested supplemental materials

# Funding Details

- Funding Agency
- Program Name
- Eligibility
- NSF's standard merit-review process including a panel
- Timeline
- **Funding Amount**
  - \$500K for 5 years
- **Anticipated Number of Awards**
  - 450 per year
- **Anticipated Acceptance Rate**
  - 20%



# Grant Details

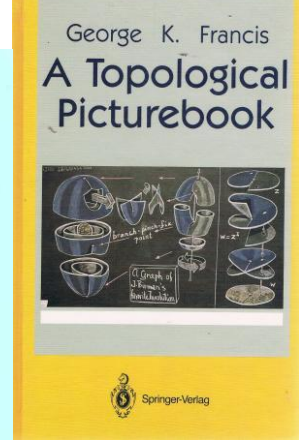
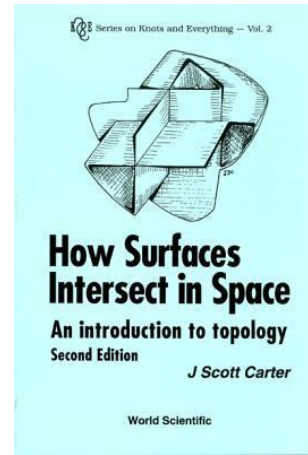
## CAREER: Visualizing Mathematical Structures in High-Dimensional Space

- Aims at depicting high-dim. static and changing math structures/phenomena
  - **basic problem**
    - High-dimensional, different to view, manipulate, and perceptualize
    - only exists in mathematicians' minds
  - **fundamental idea in the proposal**
    - new algorithms + new interaction methods
    - a paradigm to interact with high-dim. structures with their analogies in our dimension
    - accelerated computations for simulations

# Two Questions

## Why this research is important?

- Math is important
- Understanding math is difficult
- We now have new computer graphics techs, new algorithms, and new computing power to make the illustration easier, quicker, and better
- this proposed research can not only help pure mathematical researches, but can also produce educational tools for K-12 and college students' math class
  - Reidemeister moves
  - Sphere eversion
  - Zeeman theorem
  - Knot theory in high-dim.



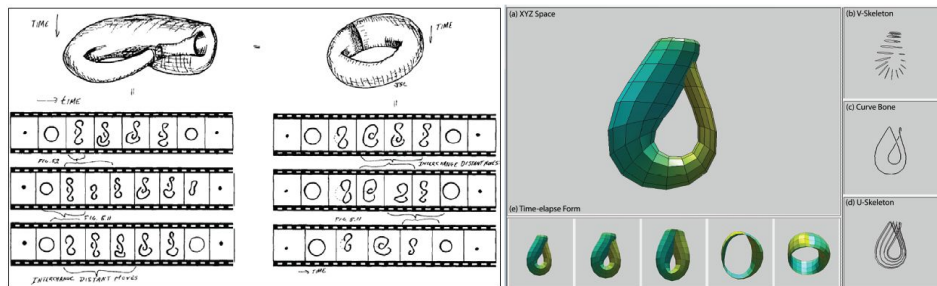
# Two Questions

- **Why you?**
  - **Preliminary research is very important**
    - **not a new idea, but a field that I have explored and published over 10 years**
      - “The PI has clearly thought a lot about the proposed activities, and I believe that the activities would be very successful ...”
      - “PI is the author of software such as \*\*\*\*\*, \*\*\*\*\*, among other software tools ....”
      - “....uniquely qualified to undertake the proposed project ...”

# Two Questions

- **Why you?**

- Preliminary research is very important
- **Collaboration and evaluation are very important**
  - mathematical visualization is not just about drawing 3D geometries
  - work with domain experts, and education experts





# Some Ideas

- **Write the proposal that both experts and non-experts will read and like**
  - ad-hoc reviewer are usually experts
  - panel reviewers might have broader (and unrelated) backgrounds
  - E/VG/VG/VG/VG/G [3 of them are from mathematicians]

# Some Ideas

- Write the proposal that both experts and non-experts will read and like
- **Read copies of successful NSF proposals**
  - NSF CAREER workshop provided successful proposals
  - schedule an 1:1 with PO
    - present your idea with passion!
    - my 1st career submission, in my first year (I had hesitation about submission)

# Some Ideas

- Write the proposal that both experts and non-experts will read and like
- Read copies of successful NSF proposals
- **Have your proposal read by your mentors, colleagues, and collaborators**
  - my own timeline
    - main idea thread developed during the last couple of years
      - a lot of visits to mathematicians
    - attended NSF career workshop in April 2016
    - writing was done in May and June 2016
    - reviewed and edited by Drs. Nasraoui, Frigui, Ralston, Tretter (June/July 2016)
    - developed evaluation and collaboration plans with mathematicians (post-notification)
      - a lot of support from Dept. and School

Questions?