



CMS RESEARCH FROM A "SLAC"

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7/6/2020



BETHEL
UNIVERSITY

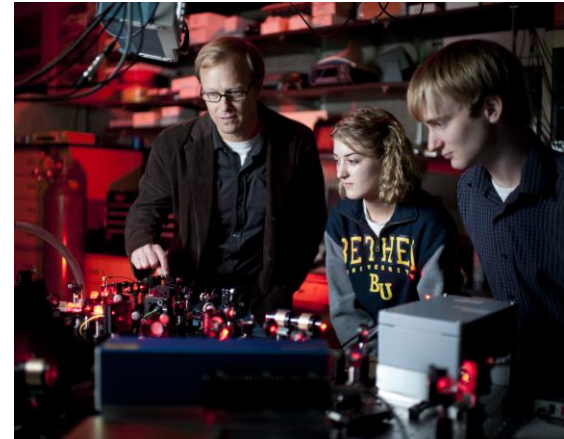
▶ Asst. Professor Julie Hogan

- ▶ B.A. '09 Vanderbilt U (CMS – Tier-2 data logistics preparation).
 - ▶ M.S. '12 Rice U (D0 – luminosity monitor & MET algorithms)
 - ▶ Ph.D. '15 Rice U (D0 – B Physics, forward-backward asymmetry measurement in $B^+ \rightarrow J/\psi K^\pm$ decays)
 - ▶ Postdoc '15-'17 Brown U (CMS)
 - ▶ Remaining active in CMS as Visiting Scientist at Brown
- ## ▶ Previous CMS activities:
- ▶ 2015 data: Jamboree '15 search for $X_{5/3}\bar{X}_{5/3}$, Moriond '16 search for $T\bar{T}$ in single lepton final state, both published as combinations
 - ▶ 2016 data: Moriond '18 search for $T\bar{T}/B\bar{B}$ in 3 leptonic channels
 - ▶ EPR: outer tracker spy channel development, commissioning data handling. Delphes simulation production for UPSG

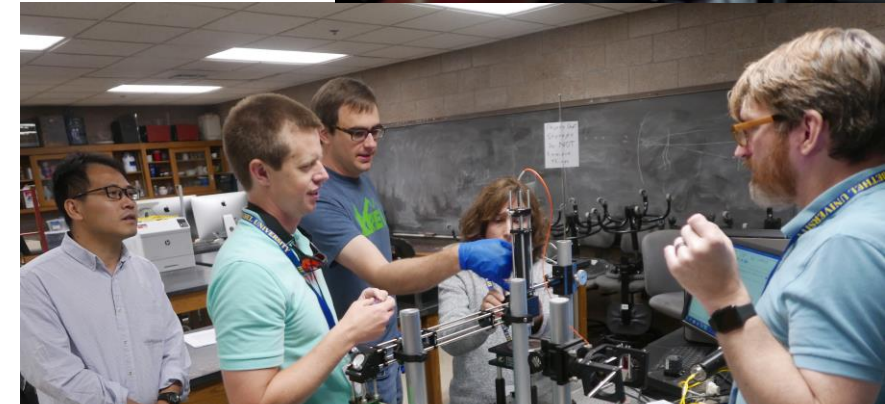
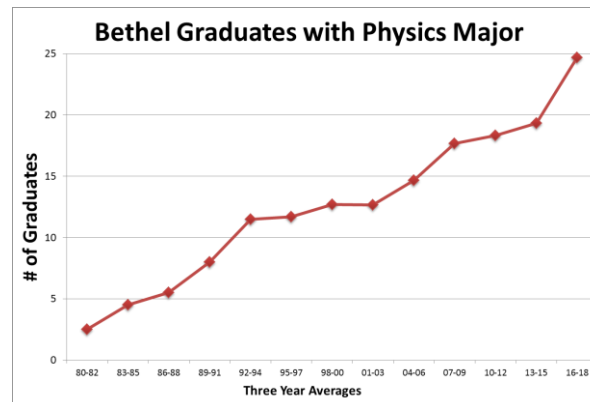


“Do you ever want to pack this in and just go teach physics to undergrads?”

- ▶ Applied for Bethel job ~January 2017
 - ▶ Webform application rather than Academic Jobs Online
 - ▶ Essays about research experience, how I would work with undergraduates
 - ▶ Institute-specific worldview essays
- ▶ School fit my interests:
 - ▶ Established in 1980 with steady growth since, known for excellent physics education
 - ▶ Selected as **1 of 21 “thriving” physics departments** (of >780), [*Physics Today* '03](#)
 - ▶ **Classroom-integrated research:** 2017 [PER paper](#) on effectiveness of labs



Among the largest undergrad-only physics departments nationally ([AIP](#))



Do you ever want to pack this in and just go teach physics to undergrads?

- ▶ What I think worked:
 - ▶ Skype interview – examples of working with undergrads
 - ▶ In-person interview – “sparkle”
 - ▶ They wanted breadth of research area, not duplication
- ▶ What was hard:
 - ▶ “Weirdest CV I’ve ever seen”:
 - ▶ collaboration vs single-author
 - ▶ conference talk conventions are different
 - ▶ Worry about whether “big physics” could really work at a small school
 - ▶ No adjunct or course teaching experience
 - ▶ Taught General Relativity to “Concepts in Physics” class
- ▶ Offered/accepted in summer 2017



Julie Managan Hogan is at Bethel University.

November 20, 2019 · Saint Paul, MN · 🧑🏻‍🦱

Get your tickets quick folks, the Gen Phys 2-man song-and-dance band is back for a limited time! 😊 Our wheelhouse is “nerdy slapstick”, with a little sleight of hand.



- ▶ Summer 2017: met with DOE program manager at LPC and was redirected toward NSF
- ▶ Fall 2017 – brand new prof applies to the NSF, full of hope but sure of failure
- ▶ What I knew how to do:
 - ▶ Bits of writing experience
 - ▶ Physics / Ops balance goal
 - ▶ Frequent postdoc travel to CERN/conference
- ▶ Huge helps:
 - ▶ “template” of successful proposal for an RUI grant from Matt Bellis!
 - ▶ AAPT New Faculty Workshop
 - ▶ Bethel Physics already had NSF grants
- ▶ October 2017: submitted proposal
- ▶ July 2018: notified of funding at requested level!
 - ▶ ~\$200k for 3 years = summer salary + undergraduate wages + PI/student travel + some equipment

- ▶ How do I stay an author?
 - ▶ “Visiting scientist” at Brown Univ.
- ▶ Does CMS M&O-A authorship fee get written into my budget?
 - ▶ Met with an NSF PI at the LPC: No!
 - ▶ Every year Brown adds me to the Ph.D. list and Dan moves it from DOE to NSF
- ▶ Would CMS entry fee or upgrade/ops contribution need to go in my budget?
 - ▶ Not sure yet!
- ▶ How do I bring students to CERN?
 - ▶ We all assumed Brown would sign Home Institute Declarations for students registered in the Brown group
 - ▶ No! Crisis in summer 2018...

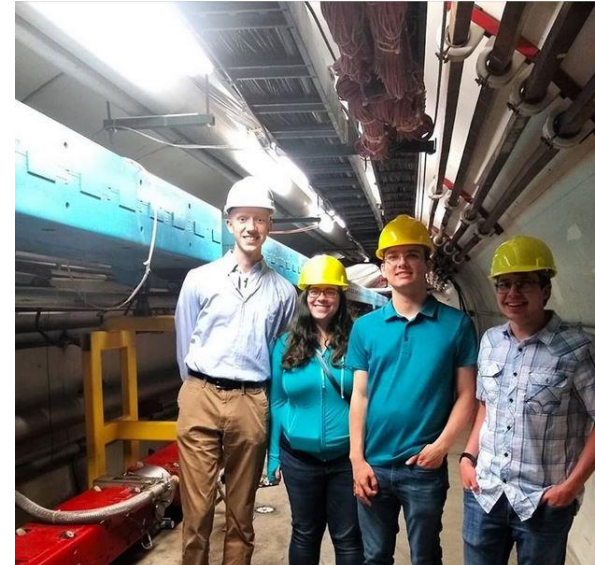
- ▶ Crisis in summer 2018... Fermilab signed for my students as part of their group for 1 month
- ▶ Started procedure to become a Cooperating Institute
 - ▶ Proposal letter
 - ▶ Meetings with management
 - ▶ Talk at CB meeting
 - ▶ Voted in Feb 2019
- ▶ Summer 2019 – got students to CERN easily with our own HIDs 😊
 - ▶ I am the Bethel Team Leader but a member of the CMS Brown institute
 - ▶ Some extra manual interaction with the Secretariat compares to other people
- ▶ Permanent roadblock: university cannot enter into contracts with (e.g.) Fermilab, so couldn't receive upgrade project labor funding for summer students
 - ▶ Fermilab group helping out again with guest-type funding, although unused due to COVID!



- ▶ Physics analysis: VLQ pair production
- ▶ L3 convenership for that subgroup
- ▶ Delphes simulation production for TDRs and YR
- ▶ Summer students working at Fermilab on OT module assembly
- ▶ Tracker operations via DQM (remote/FNAL) and DAQ (summer) shifts
- ▶ Teaching activities at the LPC
- ▶ Joining OpenData group
- ▶ 2-5 undergrad students

 Bethel University Physics & Engineering
Published by bethelphyseng [?] · June 10, 2019 · 

Fermilab crew checking out the Tevatron Collider tunnel. Happily, everyday work involves no hardhats 🧑🏻‍🔬 🧑🏻‍🔬



- ▶ More education of post-docs (at least in US)
 - ▶ Adjunct a course if PD at a university?
 - ▶ Summer student type courses if at a lab?
 - ▶ How university funding from national agencies is structured in/out of experiments
 - ▶ Funding opportunities for non-research universities
- ▶ Advocate for experiments to be more open to small groups
 - ▶ Shift requirements and remote availability
 - ▶ Service requirements per capita that benefit groups with many PhD students
 - ▶ Entry fees fixed regardless of group size
- ▶ Advising for applicants
 - ▶ Document review, course teaching practice, etc