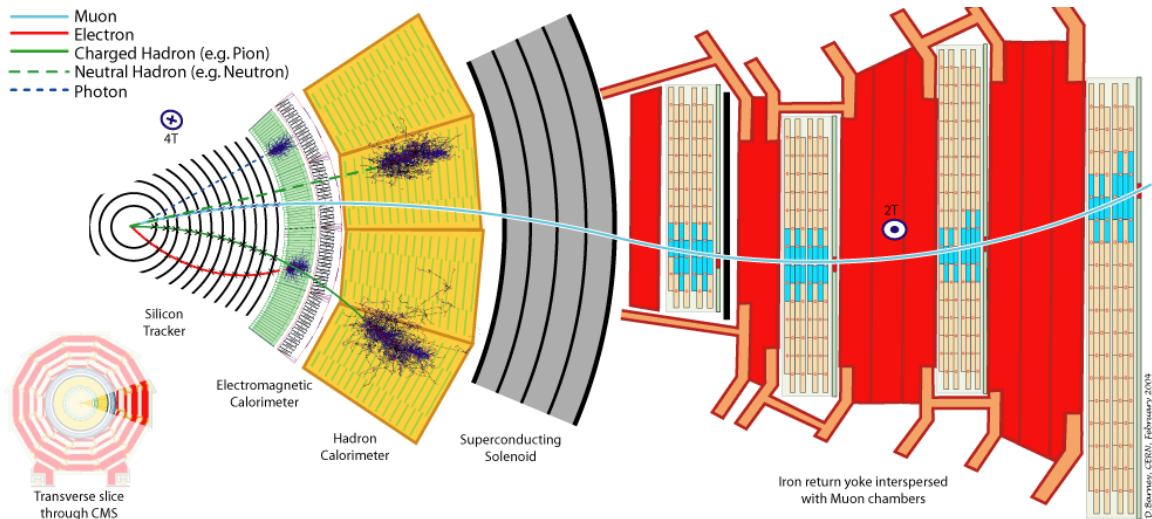
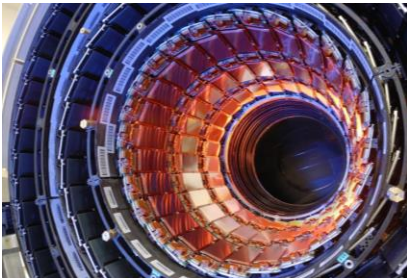


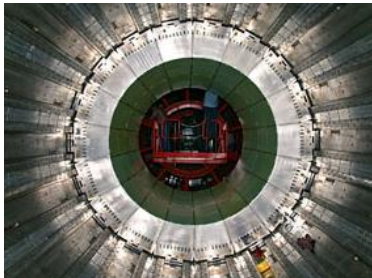
Northeastern University at CMS



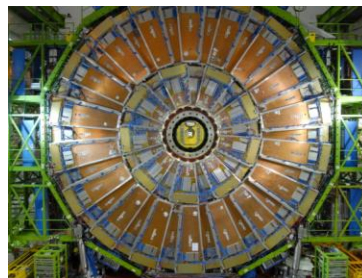
Trigger



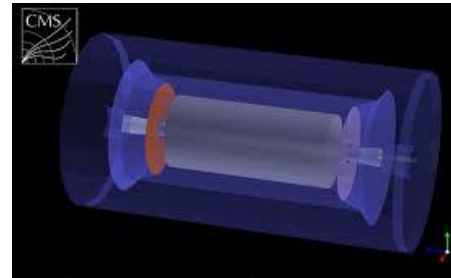
Tracking Detector



Electromagnetic Calorimeter



Endcap Muon Detector



MIP Timing Detector (new!)

Northeastern CMS Group Members



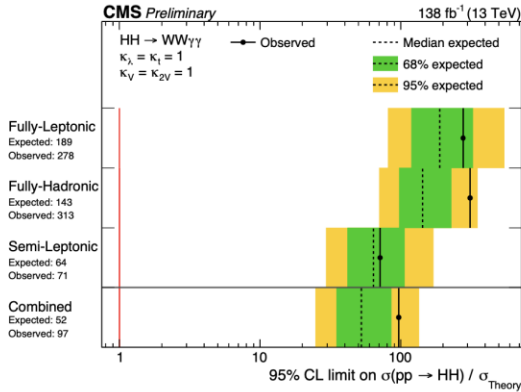
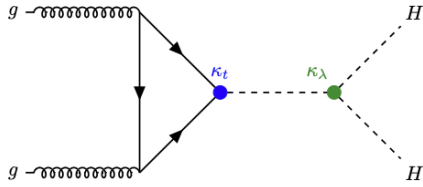
- **Faculty:** Barberis, Orimoto, Skinnari, Wood, Bonilla Castro (starting Jan 2024)
- **Research Scientist:** Morse
- **Postdoctoral Researchers:** Haddad, Lu, Parker, Seeking New Postdoc
- **Graduate Students:** Aarif, Dervan, Han, Israr, Krishna, Li, McCarthy, Morrison, Nguyen, Thoreson, Tsai
- **Undergraduate coop students:** ~1-3 during any semester full-time @ CERN
- **Well funded by National Science Foundation & Department of Energy**

Northeastern CMS Orimoto Group

- **PI:** Toyoko Orimoto, Associate Professor of Physics
- **Research Interests**
 - Exploring the high energy frontier with the CMS Detector at CERN LHC
 - Upgrading the CMS Detector for the High-Luminosity phase of the LHC
 - Discovering or constraining new beyond-the-standard-model physics
 - Utilizing the Higgs boson as a potential portal to further discoveries
 - Operating the CMS electromagnetic calorimeter (ECAL), maintaining its excellent performance, and upgrading it for HL-LHC
 - Building a new precision minimum-ionizing particle (MIP) timing detector (MTD) to bring new capabilities to CMS for HL-LHC
- **Roles:** CMS ECAL System Manager (2023-25); Diversity & Inclusion Office co-chair (2021-23)
- **CV:** https://cos.northeastern.edu/wp-content/uploads/2023/04/CV_ToyokoOrimoto_March2023.pdf

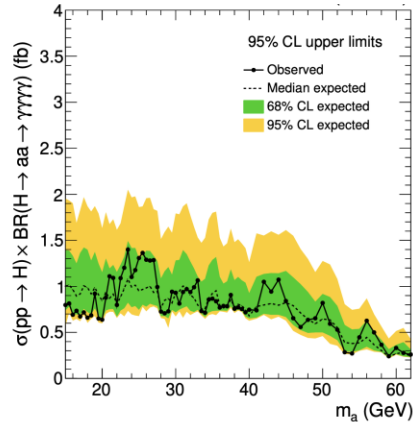
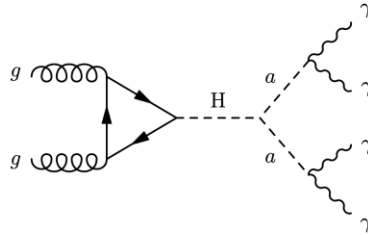
Northeastern CMS Orimoto Group: Physics

HH → WW γγ



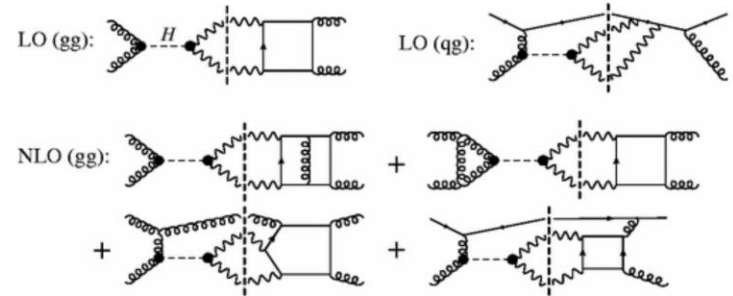
<https://cds.cern.ch/record/2840773>

H → aa → γγ



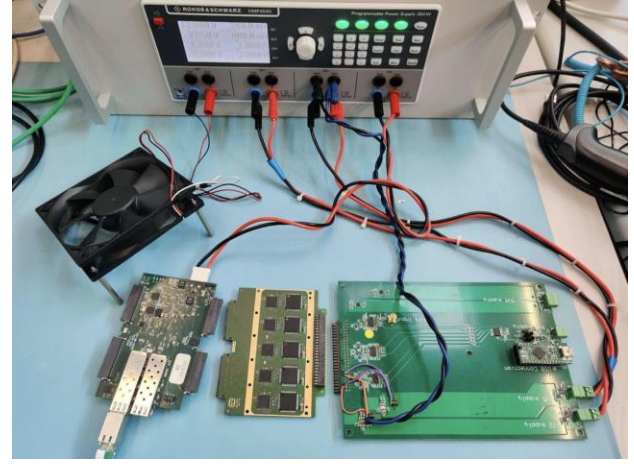
[https://link.springer.com/article/10.1007/JHEP07\(2023\)148](https://link.springer.com/article/10.1007/JHEP07(2023)148)

Higgs width through H → γγ

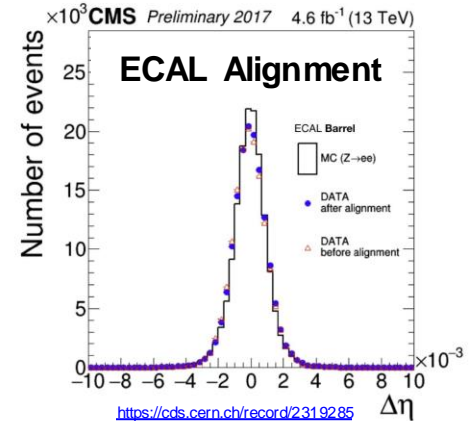
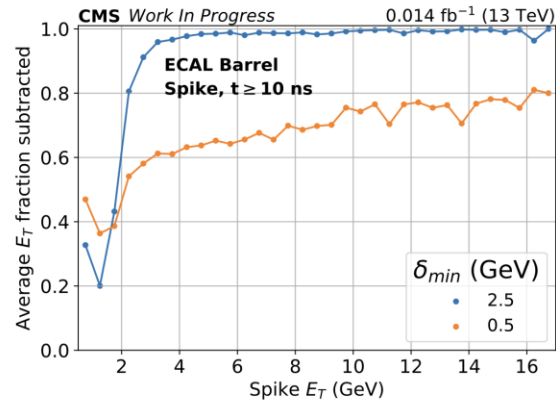
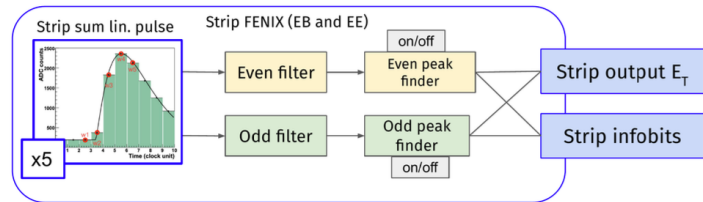


<https://arxiv.org/pdf/1305.3854.pdf>

Northeastern CMS Orimoto Group: ECAL

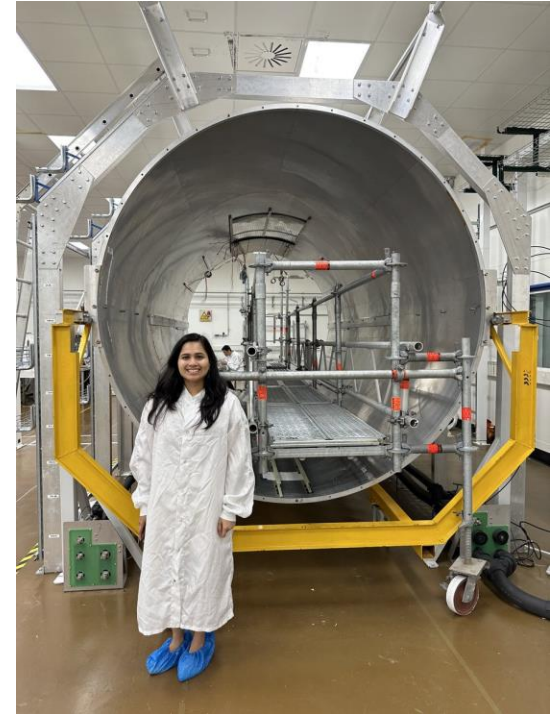


ECAL Trigger



Northeastern CMS Orimoto Group: Current

- **Postdoctoral Researchers:** Seeking New Postdoc
- **Graduate Students:**
 - **Amrutha Krishna:** Hgg indirect width measurement; ECAL Alignment; MTD BTL System Testing / Mechanics & Cooling studies @ TIF
 - **JP Dervan:** X->YH in WWgg channel; ECAL L1 Trigger; MTD BTL System Testing / Mechanics & Cooling studies @ TIF / Assembly
 - **Cort Thoreson:** ECAL L1 Trigger
- **Undergraduate coop students:** 6 months at CERN
 - **Broderick Kelly:** ECAL Upgrade of readout electronics



Amrutha Krishna @ TIF

Northeastern CMS Orimoto Group: Past

- **Postdoctoral Researchers:**

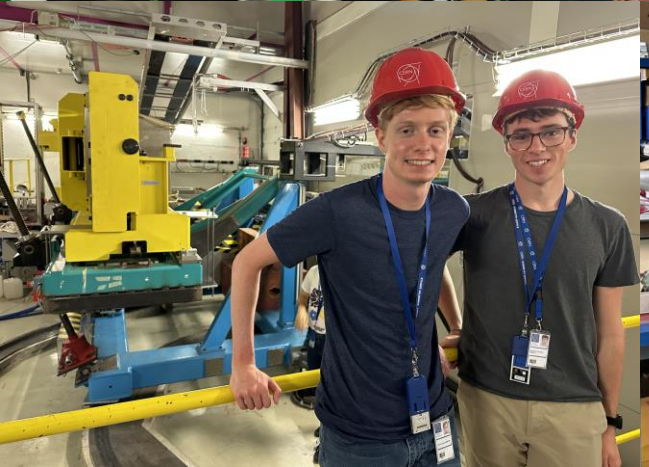
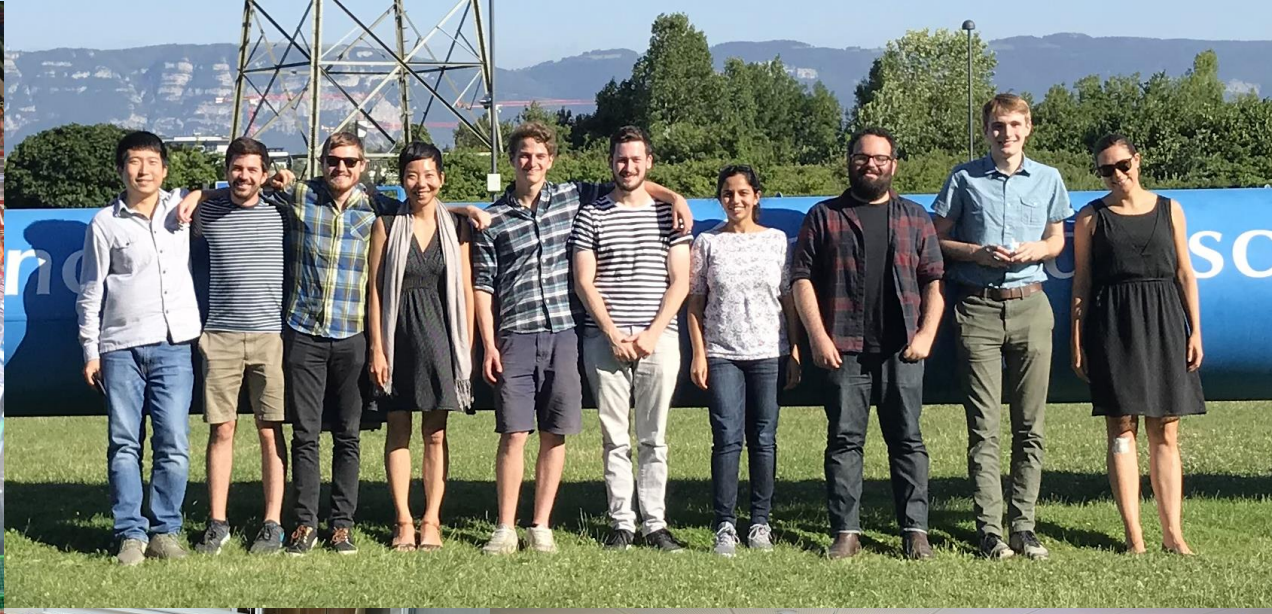
- **Badder Marzocchi:** postdoc at University of Minnesota
- **Andrea Massironi:** permanent position at INFN Milano-Bicocca

- **Graduate Students:**

- **Abraham Tishelman-Charny:** ATLAS postdoc at Brookhaven National Lab
- **Tanvi Wamorkar:** ATLAS postdoc at Argonne National Lab
- **Rafael Teixeira de Lima:** ATLAS postdoc at SLAC; now Senior Data Scientist at Sanofi

- **Undergraduate Coop Students:** ~Dozen

- **Isabel Kain:** PhD student in Astrophysics at UC Santa Cruz
- **William Benoit:** PhD student in Physics at University of Minnesota
- **Michael Plessner:** PhD student in Physics at Penn State University
- **Kelsey Yee:** PhD student in Physics at MIT
- **Kathryn Larkin:** Law student at Stanford Law School





Northeastern CMS Postdoc Position

- **Job Posting:** <https://inspirehep.net/jobs/2708444>
- **Deadline:** Reviewing applications on a rolling basis
- **Qualifications:** PhD in Experimental Particle Physics; Experience at LHC desired
- **Based:** CERN
- **Description:**
 - **Physics:** Play a leading role in physics analysis using electromagnetic objects; open to ideas from postdoc for physics analysis
 - **ECAL:** Contribute to the operation & upgrade of the CMS ECAL
 - **MTD:** Opportunity also to contribute to the new CMS MIP timing detector
 - **Future Collider:** Possibility of contributing to R&D studies for Muon Collider
 - **Mentoring:** Help advise PhD students
- **Teleworking:** possible ~couple days a week