cylindrical space.

Hadronic jets & machine exploration of sub-nuclea

Jet Image

Convolution   Max-Pool

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BERKELEY LAB

BIDS.
BERKELEY INSTITUTE
FOR DATA SCIENCE
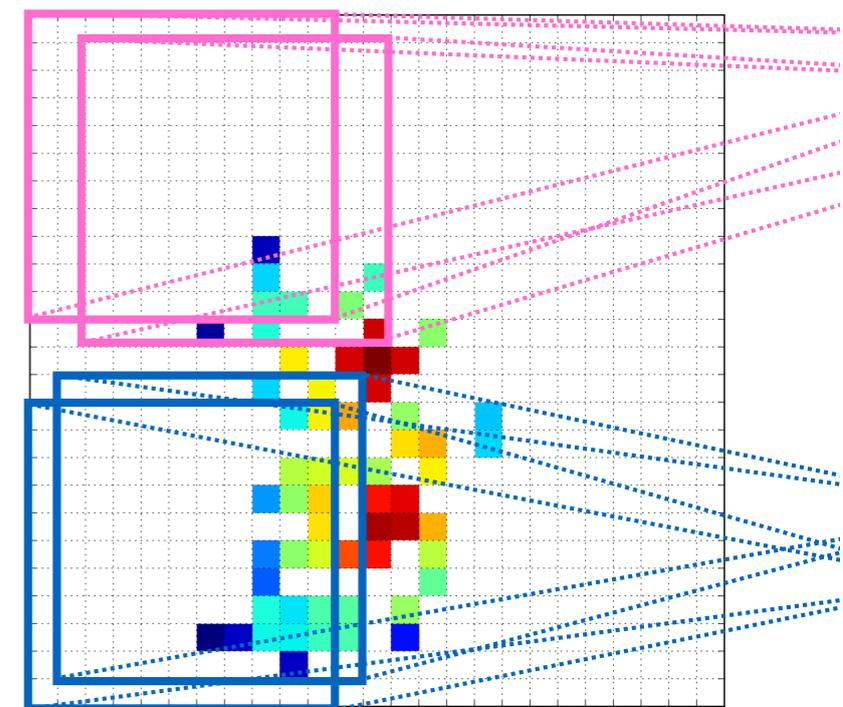
YEPP Award,
EPS-HEP
July 26, 2021

ws for an image-

Mixed Sample 1   Mixed Sample 2
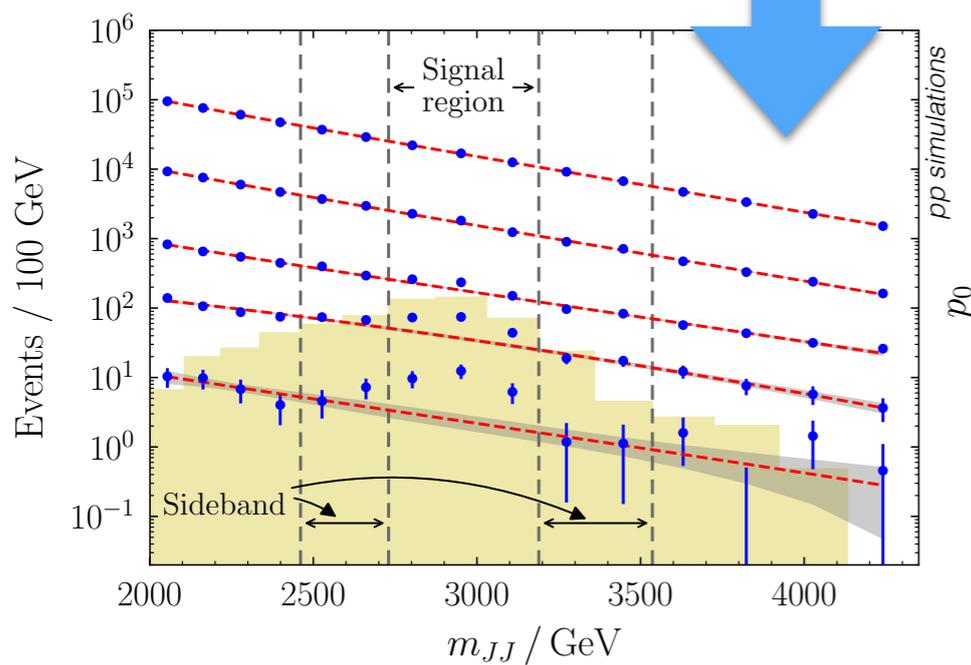
0   1
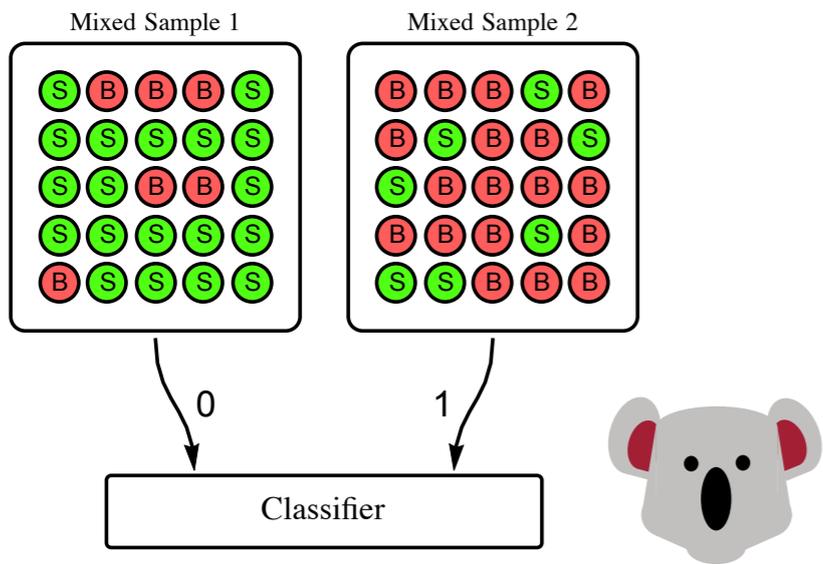
Classifier

Classification **W**ithout **La**bels
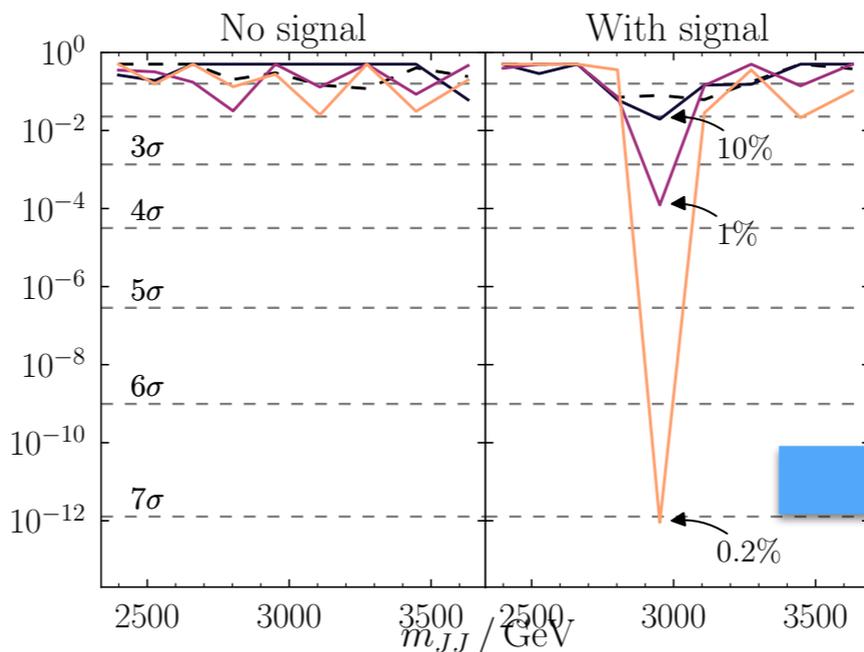
E. Metodiev, BN, J. Thaler, JHEP 10 (2017) 174

Looking towards the future:

LHC Olympics

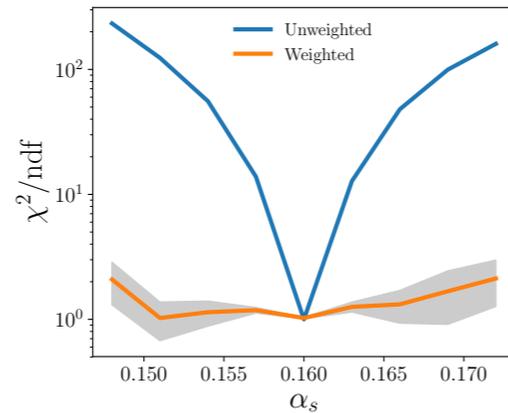G. Kasieczka, BN, D. Shih (editors) et al. 2101.08320

Signal region

Sideband

m_{JJ} / GeV

Events / 100 GeV

pp simulations

CWoLa Hunting

No signal   With signal

3σ
4σ
5σ
6σ
7σ

10%
1%
0.2%

p_0

m_{JJ} / GeV

pp simulations

J. Collins, K. Howe, BN, PRL 121 (2018) 241803

ATLAS

$\sqrt{s}$ = 13 TeV, 139 fb^{-1}

✕   Injected Signal

m_A = 3000 GeV
m_B = 400 GeV
m_C = 80 GeV

B
A
C

m_2 [GeV]

m_1 [GeV]

NN output

pp simulations
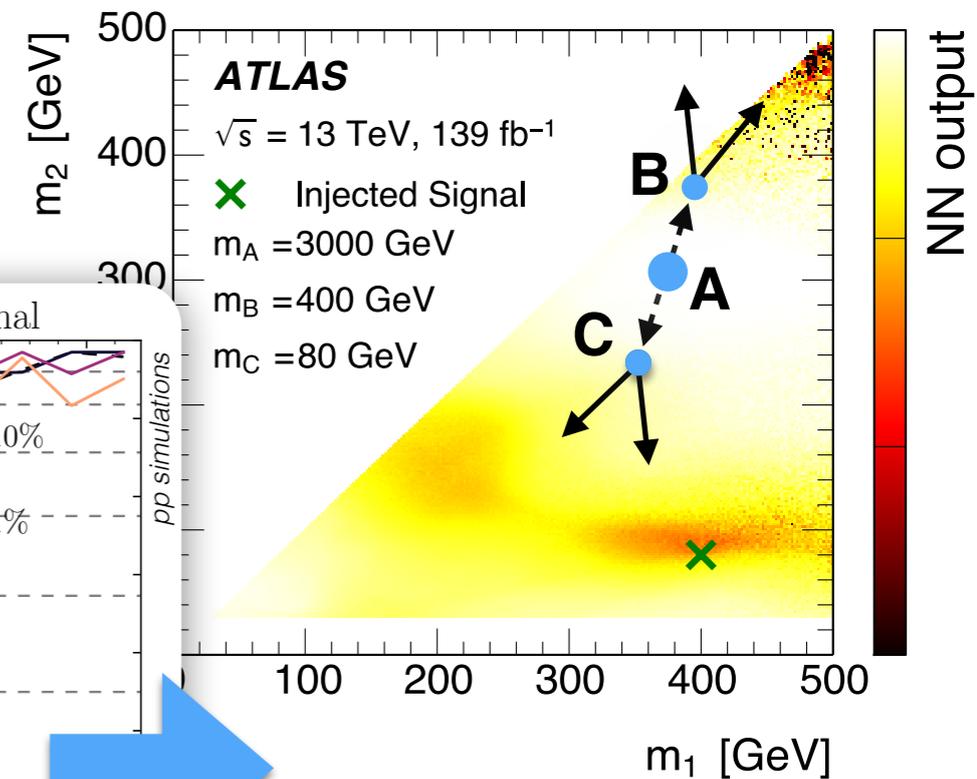
Collider data

ATLAS Collaboration,
PRL 125 (2020) 131801

Deep neural networks for **C**lassification for **T**uning and **R**eweighting
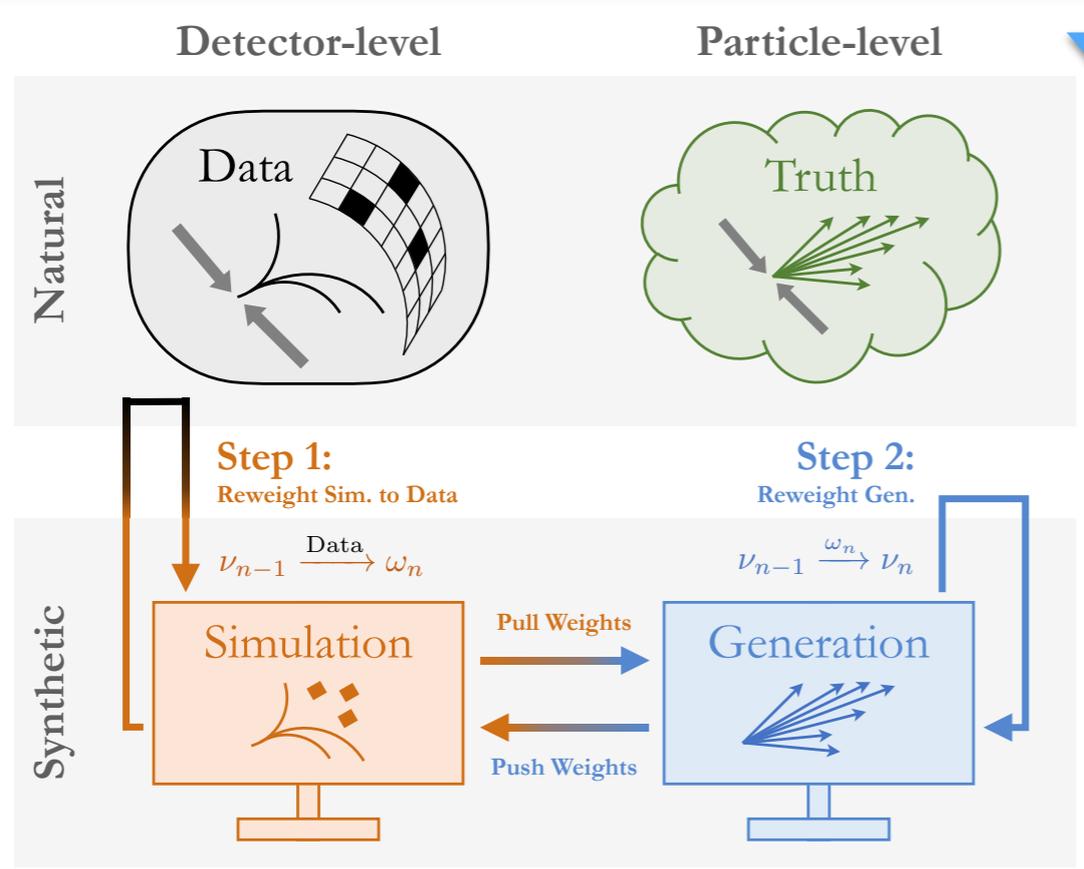A. Andreassen and BN, PRD 101 (2020) 091901
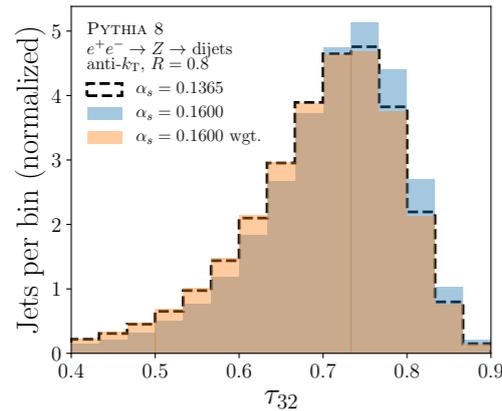
Publishing Unbinned Experimental Measurements and Theory Predictions
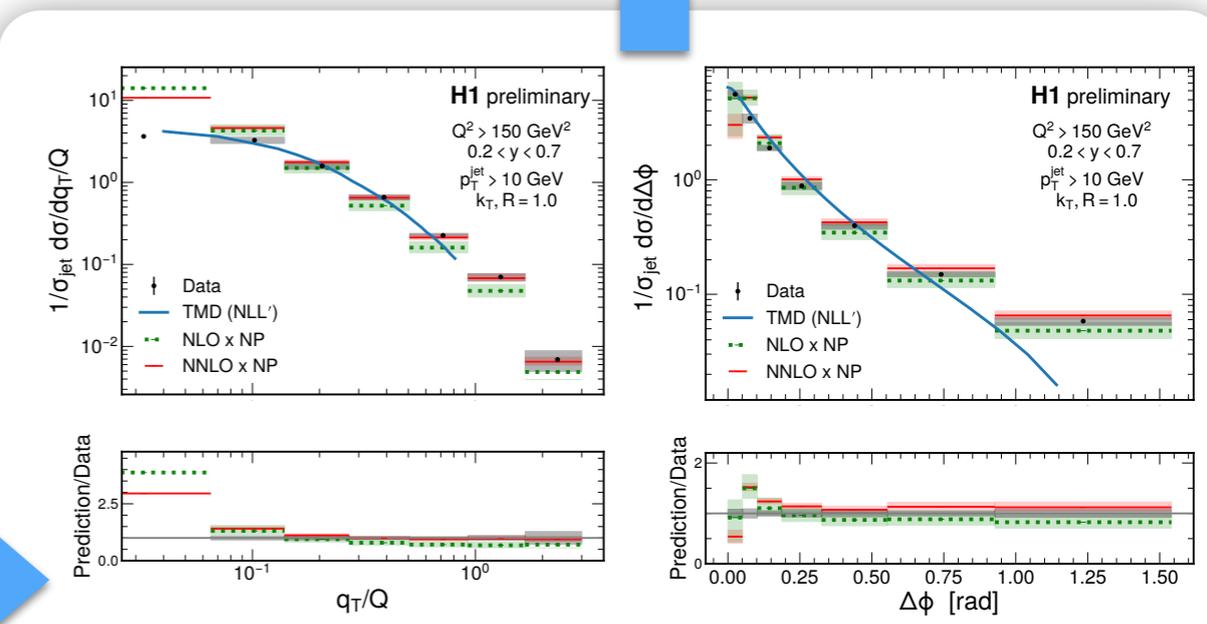
PhysTeV Participants, 2021

As a community, we are preparing for a future in which bins are determined after the fact and not before !

Unbinned & high-dimensional unfolding: **OmniFold**
A. Andreassen, E. Metodiev, P. Komiske, BN, J. Thaler, PRL 124 (2020) 182001

multidimensional unfolding for electron-jet azimuthal correlations

Collider data
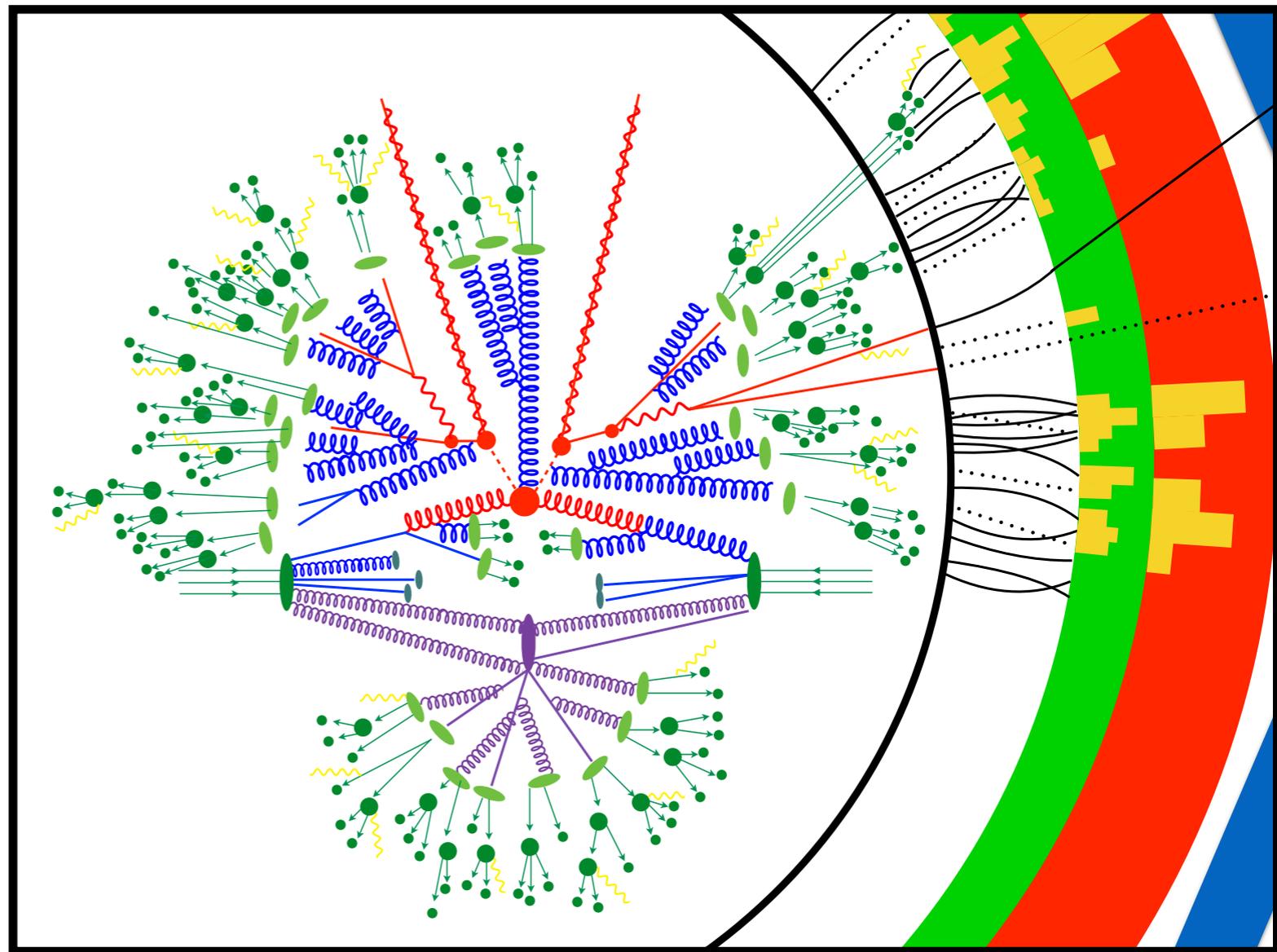
H1 Collaboration,
H1prelim-21-031

It is a great honor to receive this award and I am grateful for the strong support from my amazing mentors, mentees, collaborators, friends, and family !

In particular, it has been (and continues to be!) a pleasure to work in the **ATLAS Collaboration**

…and over the years, I have thoroughly enjoyed working in CROP (2006-2008), CMS (2009-2012), RD53 (2016-2018), RD50 (2017-2020), and H1 (2021-)

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A special shoutout to the Cosmic Ray Observatory Project (CROP) team at the University of Nebraska for introducing me to experimental particle physics!

(outreach works!)