

JOHN O'MEARA, SAINT MICHAEL'S COLLEGE

GORILLAS IN THE MIST: 2 TMT KEY PROJECTS

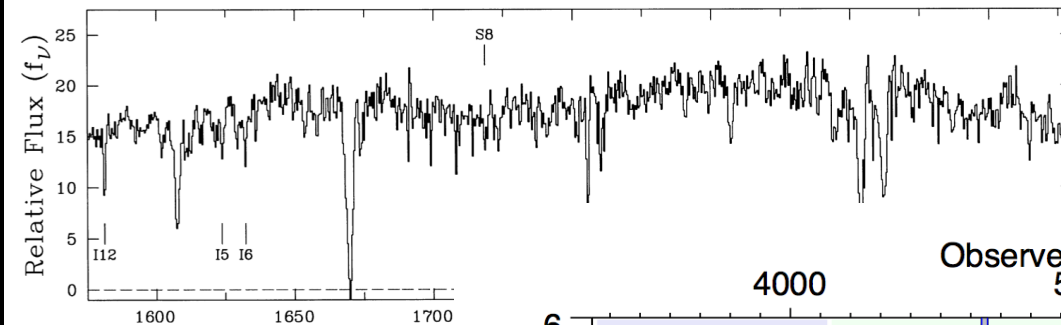
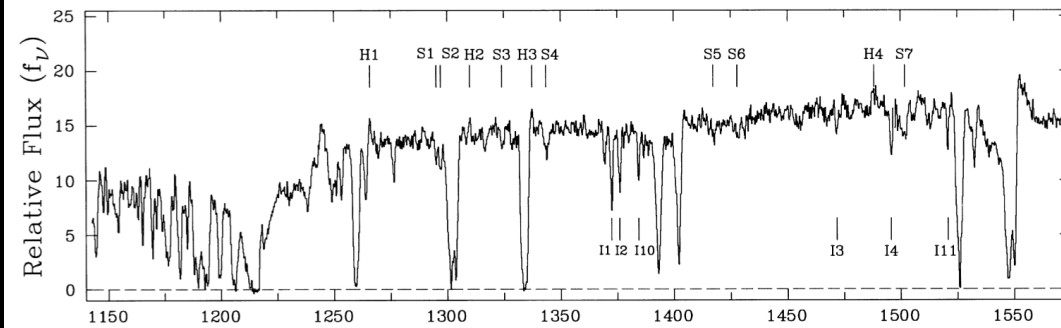
THE GORILLAS

The Big STICK: A square degree exploration of the inter- and circumgalactic medium at $2 < z < 3$ with TMT

Abstract of Scientific Justification *(will be made publicly available for accepted proposals):*

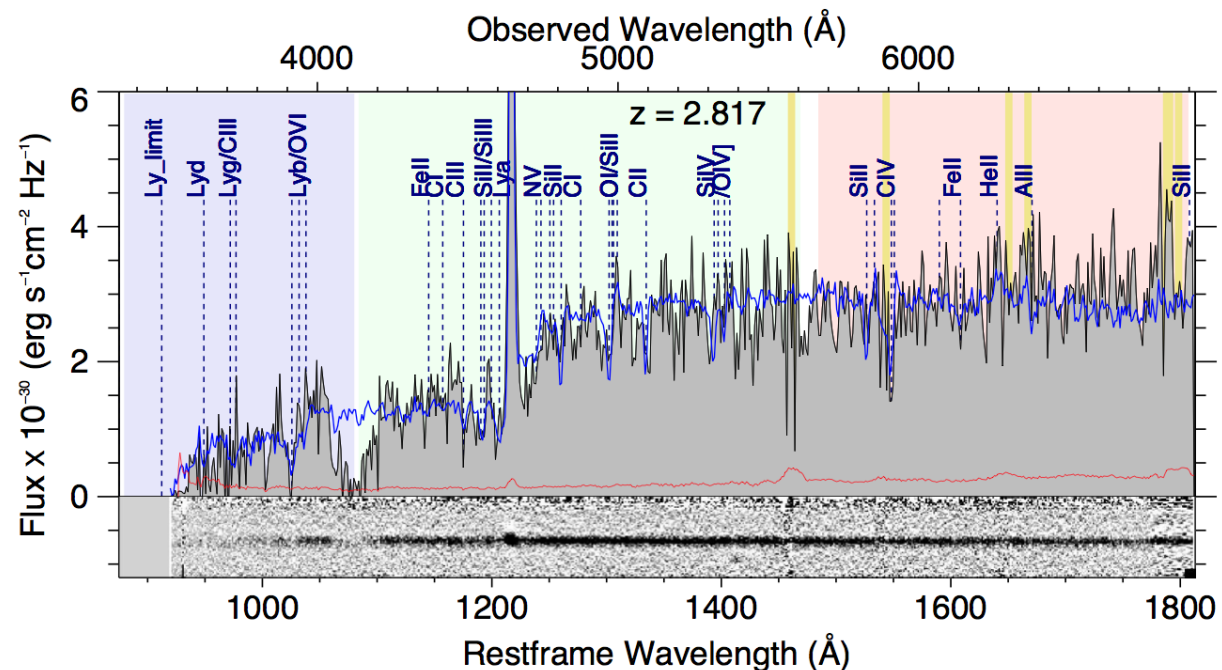
We propose a Key project for TMT, the Big STICK (**S**quare-degree **T**M**T** **I**GM **C**GM **K**ey-project). The program intends to be the definitive exploration of galaxies and their environments at the peak of their assembly. By using WFOS in low ($R = 1,000$) and intermediate ($R = 5,000$) resolution modes, we will characterize the CGM of galaxies directly, and determine the 3D distribution of gas at $2 < z < 3$ via tomography of the IGM. By sampling a square degree on the sky at near 100% completeness to $R < 26.5$ in low resolution and $R < 24.5$ in high resolution, we will provide the state of the art benchmark against which cosmological and galaxy-scale simulations should be compared, and will establish strong legacy database complimentary with LSST, WFIRST, and other large-scale surveys in the next few decades.

THE GORILLAS WITH WFOS

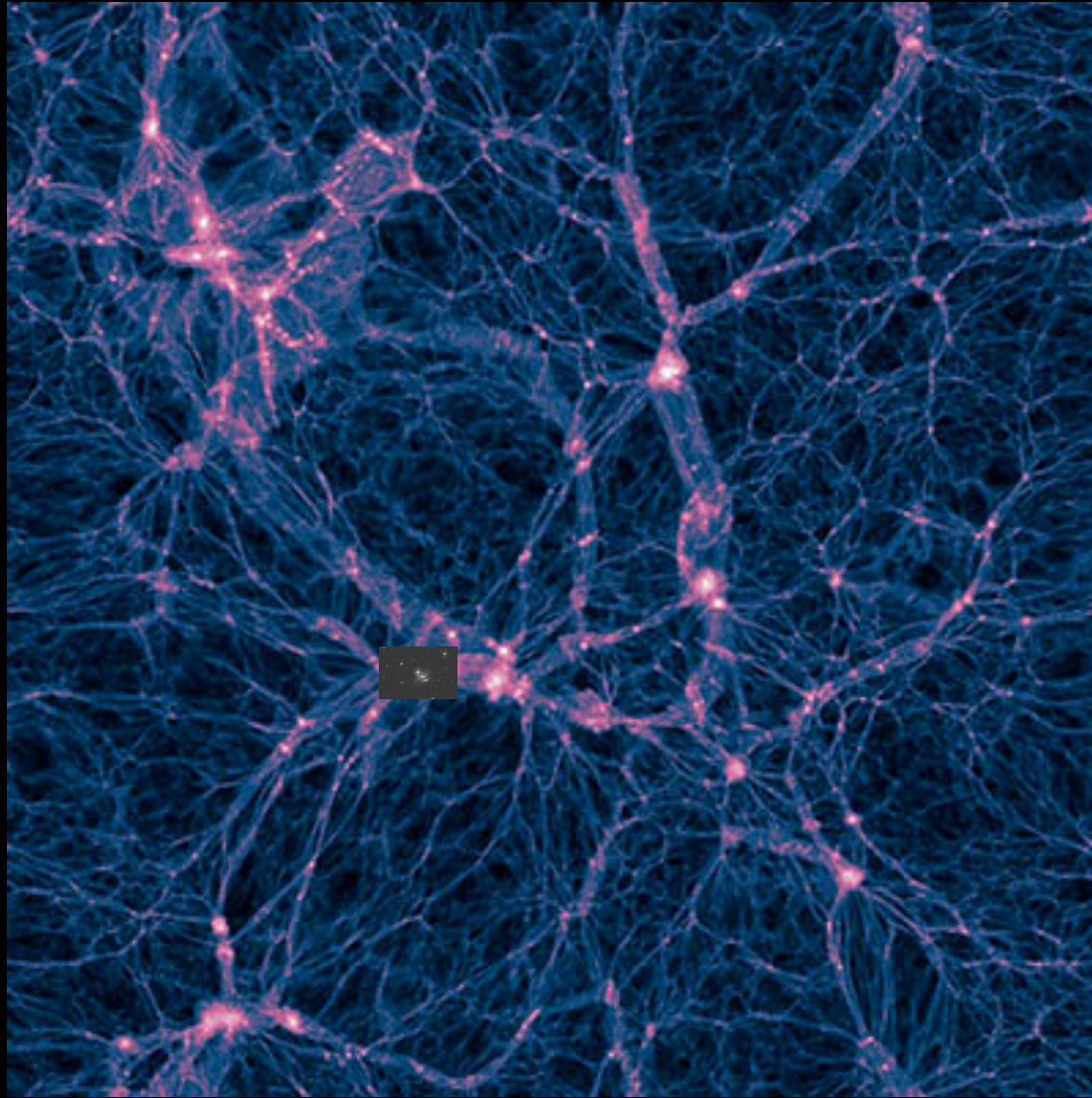


very
Bright LBGs
->
Normal LBGs

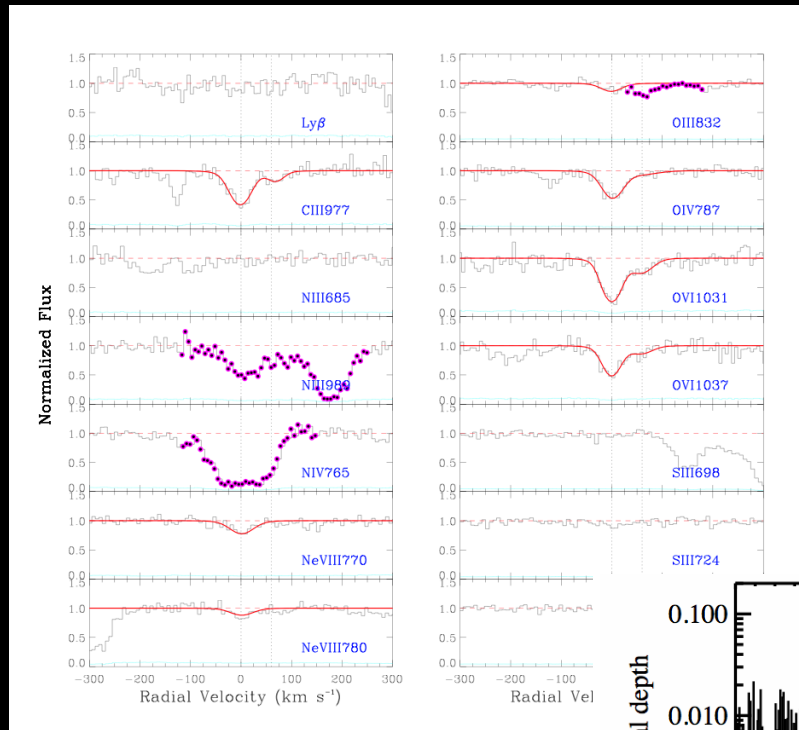
"normal"
LBGs
->
bright LBGs



THE MIST

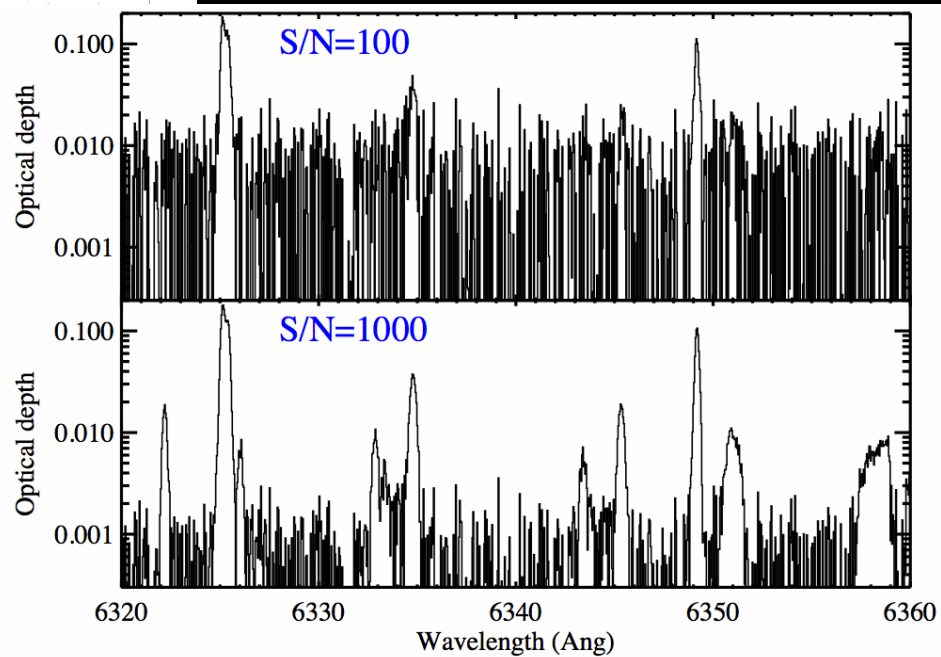


THE MIST WITH HROS



TMT as
fossil hunter

TMT as an X-Ray
telescope



WHAT'S IT GONNA COST ME?

Table 1: The Big STICK survey design

	# of pointings	masks/pointing	exp. time/mask	coverage	R	SNR
Mode 1	144	4	1 hr	1 degree ²	1000	> 5
Mode 2	72	2	4.5 hr	1/2 deg ²	5000	> 35

- 122 nights for tomography and gorillas
- 100 nights for mist
- Much of this science *can only be done with TMT on Mauna Kea*