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UNIVERSITY OF TORONTO

UNLAP INSTITUTE or astronomy & astrophysics

# HeNOS - MCAO laboratory bench @ NRC Herzberg - Astronomy & Astrophysics

Etsuko Mieda May 26, 2016

#### TEAM:

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## HeNOS: Herzberg NFIRAOS Optical Simulator

- NFIRAOS simulating bench at NRC-Herzberg
- Compare simulated performance with real, but controlled, data
- Validate NFIRAOS calibration procedures and control algorithms
- Real-time PSF reconstruction on MCAO system



#### NFIRAOS, the first light AO for TMT

the Narrow Field Infrared Adaptive Optics System





#### HeNOS bench parameters

	Design	Measurement
LGS asterism	4.5"	4.5"
Telescope size	8 m	8.13 m
Actuator distance	0.89 m	0.914 m
Subaperture size	0.27 m	0.267 m
Science FoV	10.9"	11.04"
DM heights	[0, 11.2] km	[0, 12] km
Phase screen heights	[0, 4.2, 14] km	[0.6, 5.2, 16.3] km
LGS heights	90 km	98.5 km

#### NFIRAOS vs HeNOS

	NFIRAOS	HeNOS
FOV	120"	10.9"
Telescope diameter	30 m	8 m
Wavelength λ	1.6 µm	670 nm
LGSs	6	4
LGS asterism diameter	70"	6.4"
Altitude stretch	1	11
r_0 (@ λ)	0.75m	0.751m















### Lenslet PWFS







Double Roof Prism PWFS







Double PWFS

#### by Maaike Van Kooten







