



# Aerospace Engineering @ Cairo University

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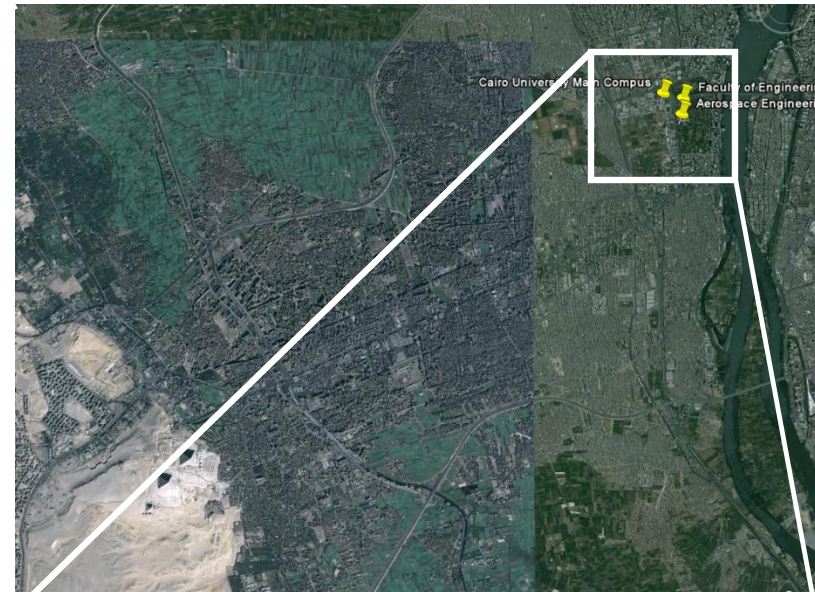




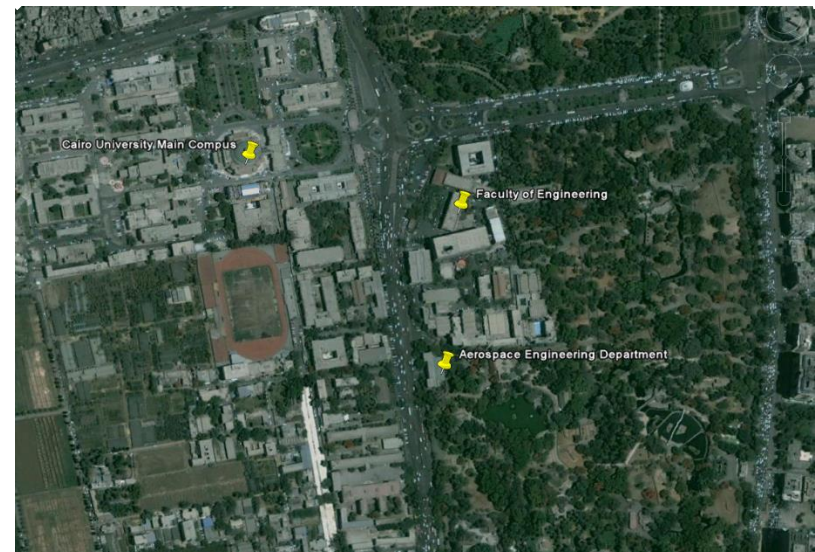
# Outline

- Introduction about Cairo University
- Introduction about CUFE & AE
- AE Laboratories
- Professional Career
- Space Related Research
- CLTP
- Space Systems Technology Activities

# Location



Aerospace Engineering Department



# Cairo University



- Located in Giza, Egypt. Founded December 21, 1908.
- Ranked among World Top 500 Universities (2013)
- More than 200,000 Students
- 21 faculties and 4 Institutes
  - The Faculty of Agriculture
  - The Faculty of Arts
  - The Faculty of Computer and Informatics
  - The Faculty of Medicine (1<sup>st</sup> in Africa and ME)
  - The Faculty of Oral Dental Medicine
  - The Faculty of Engineering
  - The Faculty of Mass Communications
  - The Faculty of Physiotherapy
  - The Faculty of Science
  - African Studies and Research Institutes
  - The Faculty of Kindergarten
  - Statistical Studies and Research Institute
  - The National Laser Institute
  - The Faculty of Archaeology
  - The Faculty of Commerce
  - The Faculty of Political Sciences
  - The Faculty of Dar El-Ulum
  - The Faculty of Economics and Political
  - The Faculty of Law
  - The Faculty of Pharmacology
  - The Faculty of Regional and Urban Planning
  - The Faculty of Veterinary Medicine
  - The Faculty of Nursing
  - The Institute of Educational Studies and Research
  - The National Cancer Institute
  - Faculty of specific education
- Center of Space Studies and Research Established January, 2003
- More than 200 Centers Providing support to Government, Public and Private sectors in Research and Development activities



# Introduction to CUFE

## 1866-1916: The Beginning of Engineering Education in Egypt

### Emerging Specializations

In **1866**, two separate departments for Irrigation and Architecture were established. The study was extended to five years with the first as a preparatory year, and specialization took place in the final two years of study. In 1896, the two Departments of Irrigation and Architecture were grouped again in one single department.

### The Royal School of Engineering

In October **1902**, the school was moved to a temporary location in the premises of the School of Agriculture at Giza. By 1905, the new buildings of the “Royal School of Engineering” bordering Giza Zoo and facing Orman Park, were completed. The school was then moved to this location and remained there ever sense. In October 1908, study was once more divided into two departments for Irrigation and Architecture with specialization in the final two years. But in **1916**, the school started to offer specialized studies in the final two years in five departments: Irrigation, Architecture, Municipal, Mechanical and Electrical Engineering.



# Introduction to CUFE

## Current Status

The Faculty of Engineering comprises at present the following fourteen scientific departments:

1. Engineering Mathematics and Physics
2. Architectural Engineering
3. Structural Engineering
4. Public Works
5. Irrigation and Hydraulics
6. Mechanical Power Engineering
7. Mechanical Design and Production
8. Aeronautical & Aerospace Engineering
9. Electrical Power and Machines
10. Electronics & Communications Engineering
11. Chemical Engineering
12. Mining, Petroleum and Metallurgy
13. Biomedical Engineering and Systems
14. Computer Engineering

The number of faculty members approaches 1000 and the number of under-graduate students is about 14000. M.Sc. and Ph.D. degrees awarded during 1995/1996 reached nearly 240.



# Aerospace Engineering Department



- Prof. Ibrahim El-Demirdash, Department Founder.
- In 1938/1939 Aeronautical Engineering studies were set up in the fourth year of the Mechanical Engineering Department starting from the academic year 1938/1939
- After the Egyptian revolution, Aeronautical Engineering studies were developed into a separate scientific department in the years 1953/1954 and began to offer a Bachelor degree in Aeronautical Engineering
- In the academic year 1961-1962, the Department of Aeronautical Engineering further expanded its program of study so as to begin in the second year.
- That situation continued up to the year 1972 when the university decided to re-merge Aeronautical Engineering studies in the fourth year of the Mechanical Engineering Department. This new situation continued up to the year 1986-1987 when the Department became independent again. With its present expanded program, the Department began to receive students in the first year, and was finally renamed as “Aerospace Engineering Department”.

# Aerospace Engineering Department

- Staff
  - 10 Emeritus Professors
  - 6 Professors
  - 3 Associate Professor
  - 6 Assistant Professor
  - 15 TA & RA
- Laboratories & Working Groups
  - Aerodynamics
  - Aircraft Propulsion
  - Aircraft Structure
  - Automatic Control & Flight Mechanics
  - Space Systems Technology Lab
  - UAV Systems
- Students  $\approx$  400
- Ph.D. and M.Sc.  $\approx$  50



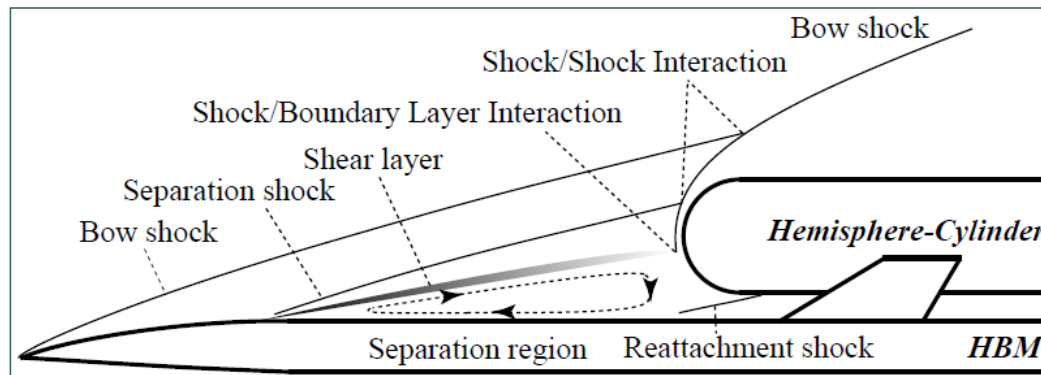
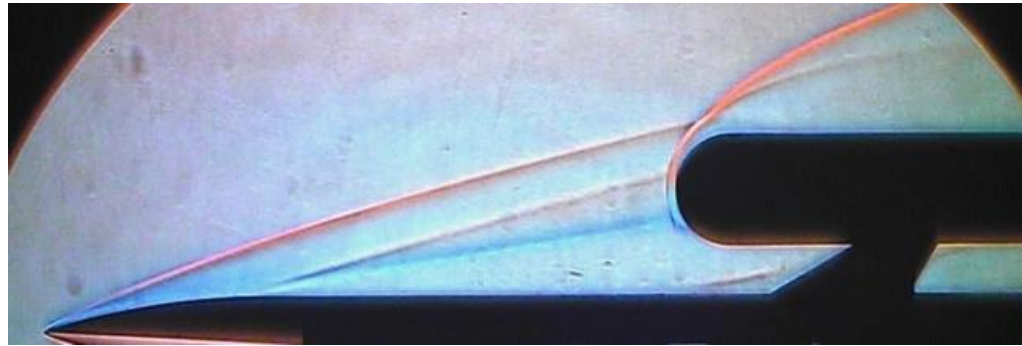




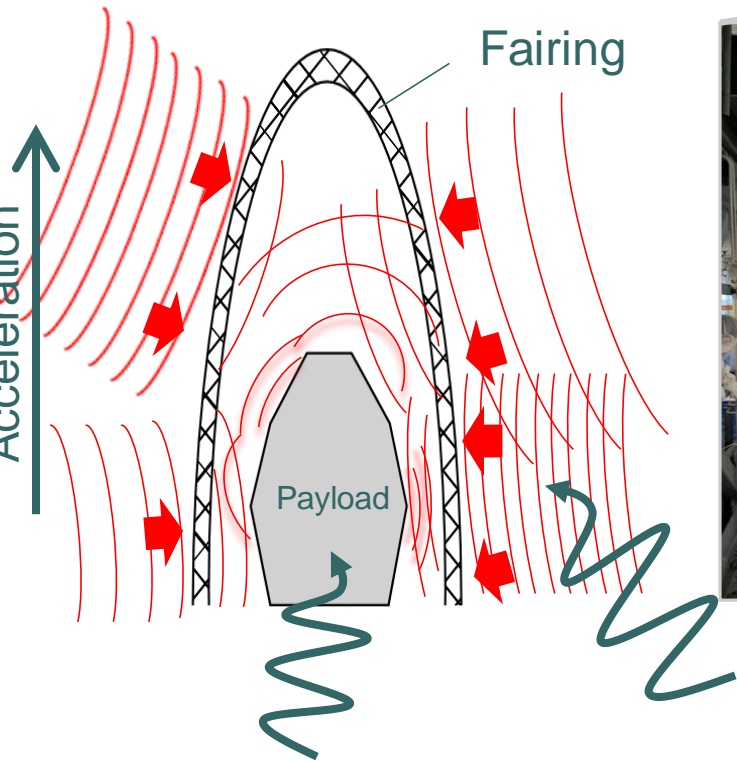
# Professional Career

- B.Sc. in AE 1991 (Cairo University)
- M.Sc. in AE 1996 (Cairo University)
- Ph.D. in AE 2001 (Nagoya University)
- Assistant Professor (2003-2008)
- Associate Professor (2009-2013)
- Professor (2014 – Present)
- Sabbatical (MHI, Volvo, NU, KFUPM, Nihon U.)

# Research: STS-TSTO



# Research: Launcher Vibro-Acoustic Study

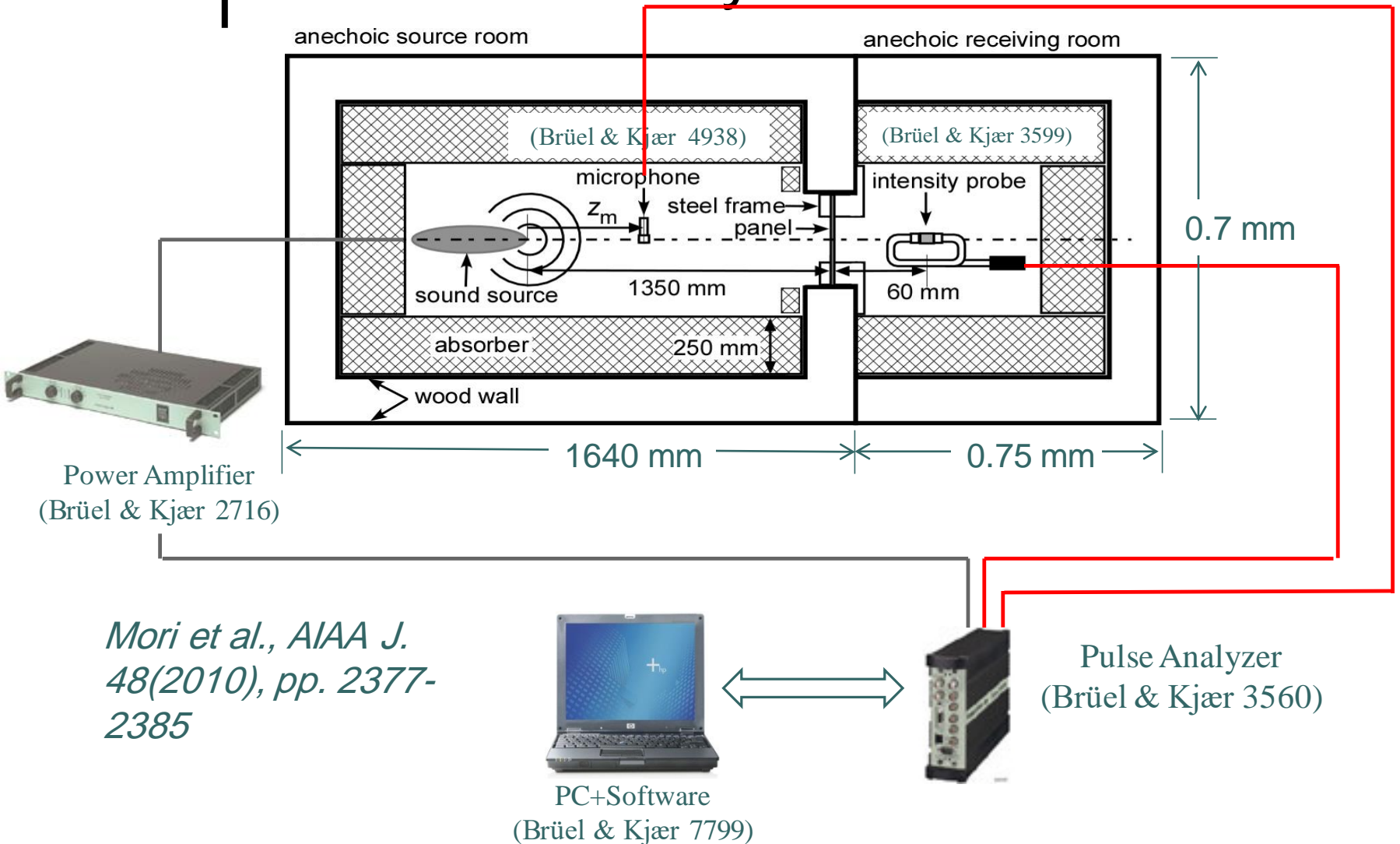


Acoustic loads (20-10000 Hz)

Mechanical Vibration (base excitation)

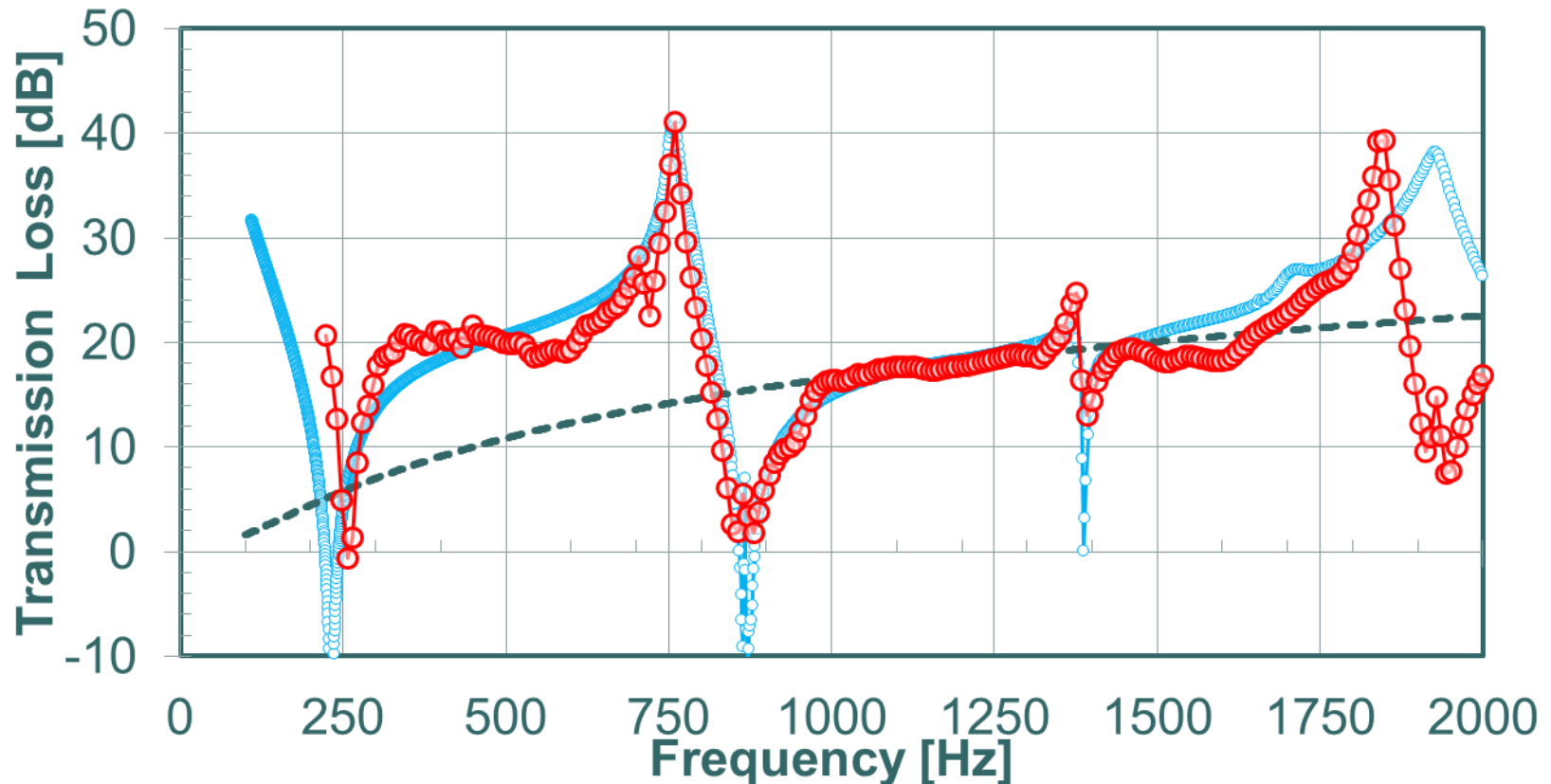
5 - 5000 Hz

# Research: Launcher Vibro-Acoustic Study





# Research: Launcher Vibro-Acoustic Study



“A simple technique for the precise measurement of transmission loss of planar sound waves”, AIAA Journal Vol. 48, No.10, October 2010, pp. 2377-2385.

# CLPT

- CLTP1 (2011) & CLPT3 (2013)
- CLTP Online Moderator (CLTP5-CLTP7)





# Space Systems Technology Laboratory Activities

- CanSat Training Program (CTP)
- Quad/Octa-Copter Developments
- Ground Station
- CubeSat

# CTP-I

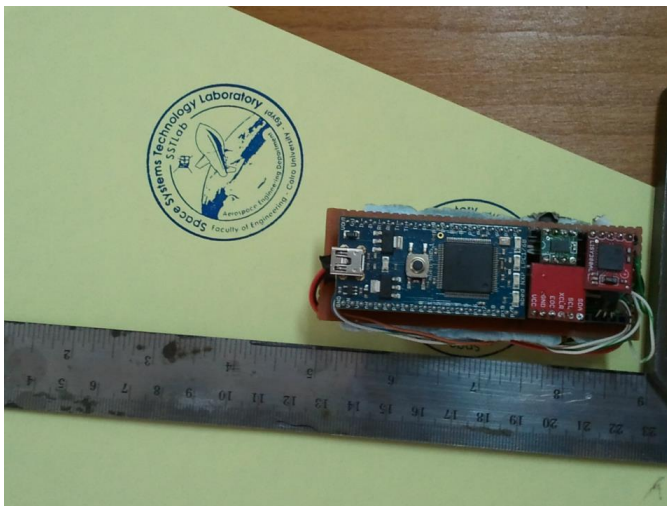
- CTP-I (July 15 - 31, 2011) – 17 Students





# CTP-II

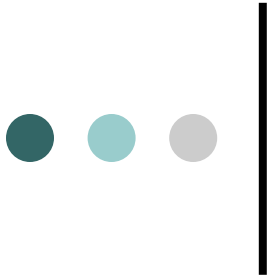
- CTP-II (Feb, 4 - 9, 2012) – 9 Students



# CTP-III, IV, V, and VI

- CTP-III (Feb, 1 - 10, 2013) – 10 Students





Thank you