My experience as FNAL summer student

Gabriele Taddei

MUSE General Meeting

30 September 2016

UNIVERSITÀ DI PISA

Mu2e

About myself

Name: Gabriele

Surname: Taddei

Place of birth: Pietrasanta (LU)

Date of birth: 03 October 1992

Residence: Camaiore (LU)

Education: Bachelor Degree in Mechanical Engineering at University of Pisa

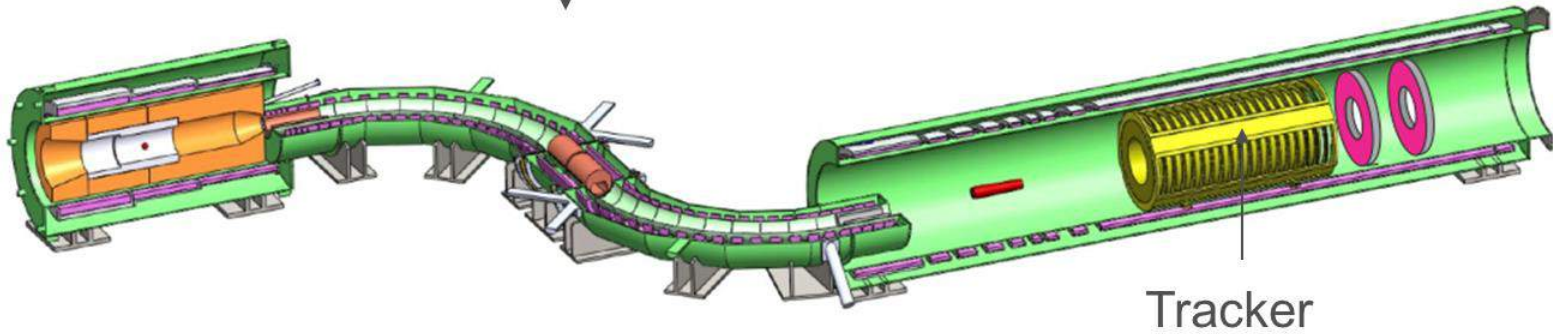Currently attending Master Degree in Mechanical Engineering at University of Pisa
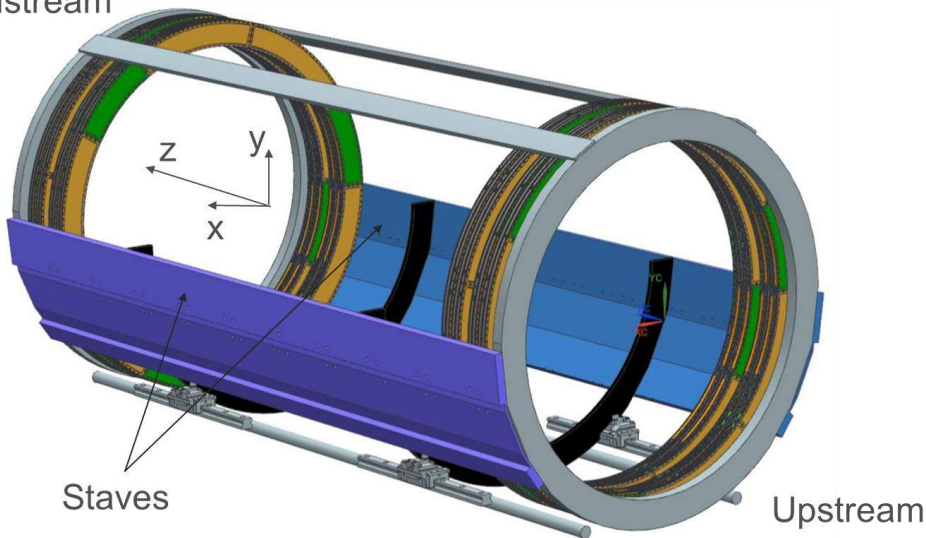
Mu2e DS Tracker

Production Solenoid (PS)
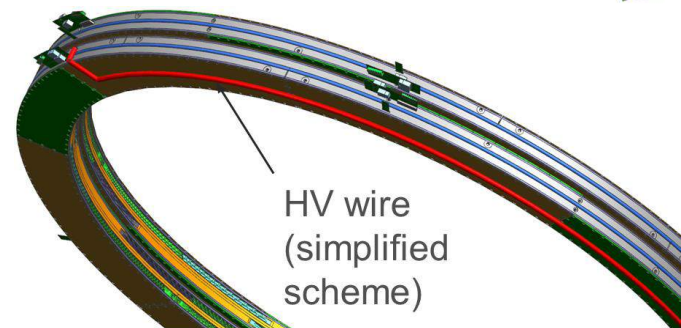
Transport Solenoid (TS)

Detector Solenoid (DS)

Tracker

Downstream

z y

x

Staves

Upstream

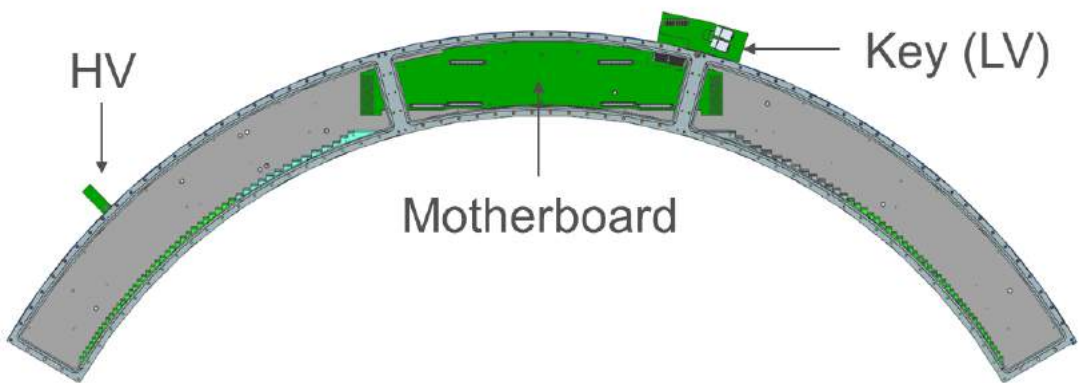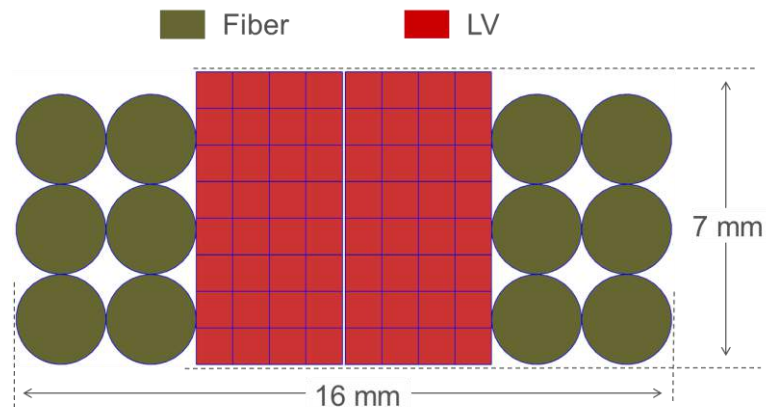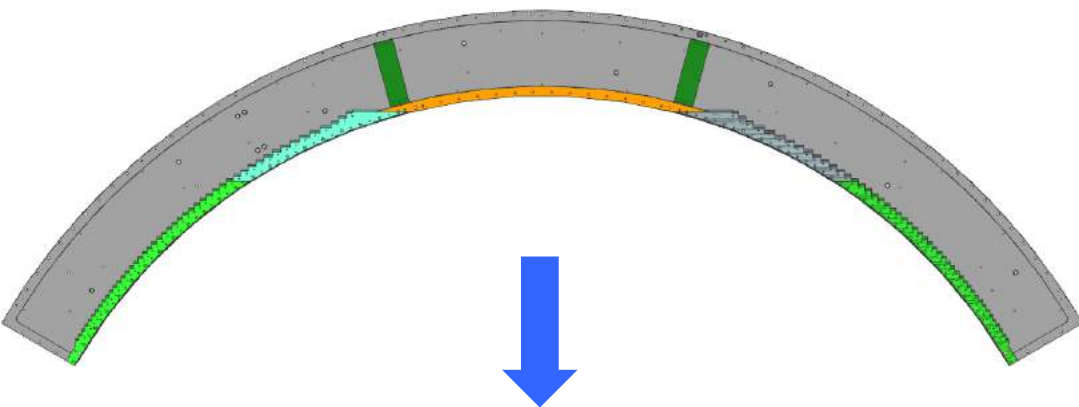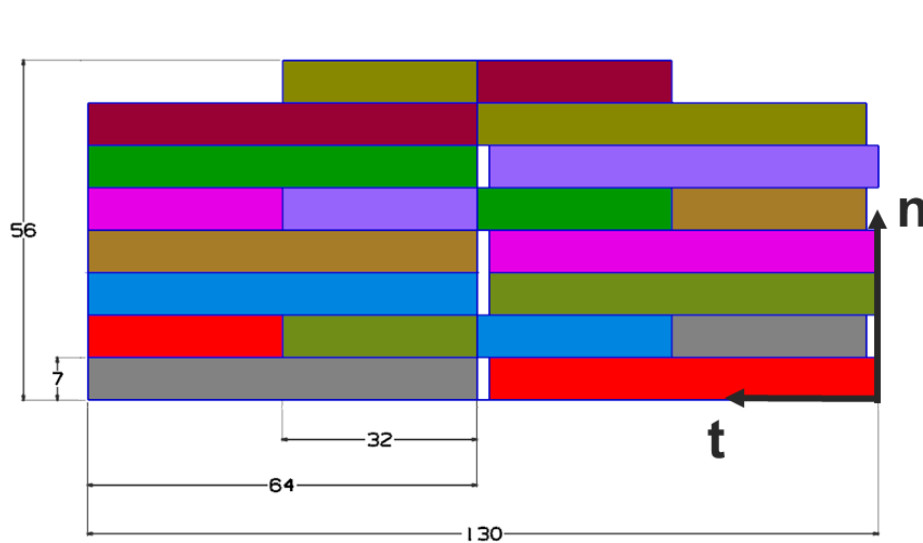1. Conceptual design of electrical and gas system

2. Analytical evaluation of mounting planes uncertainty

3. Planes contact pressure analysis

T1: Conceptual design of electrical and gas system
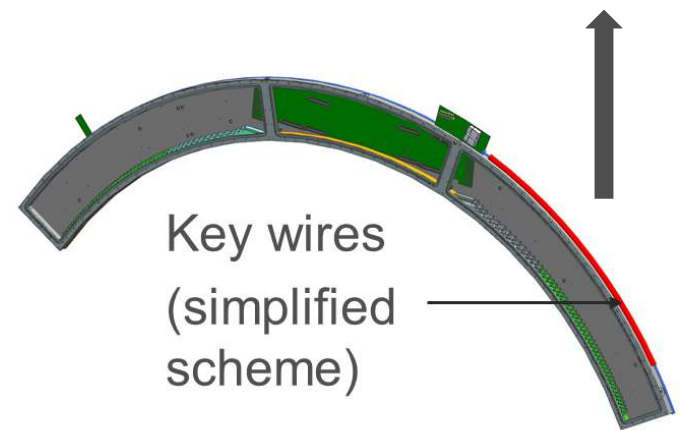
HV

Key (LV)

Motherboard

Fiber   LV

7 mm

16 mm

Key wires (simplified scheme)
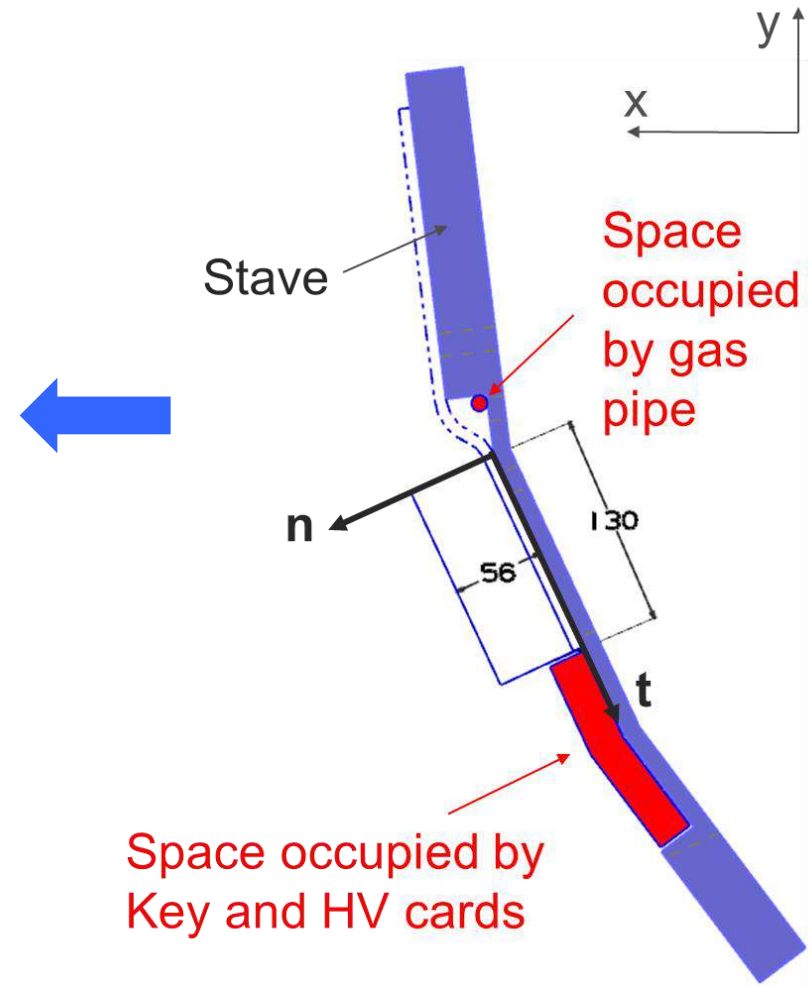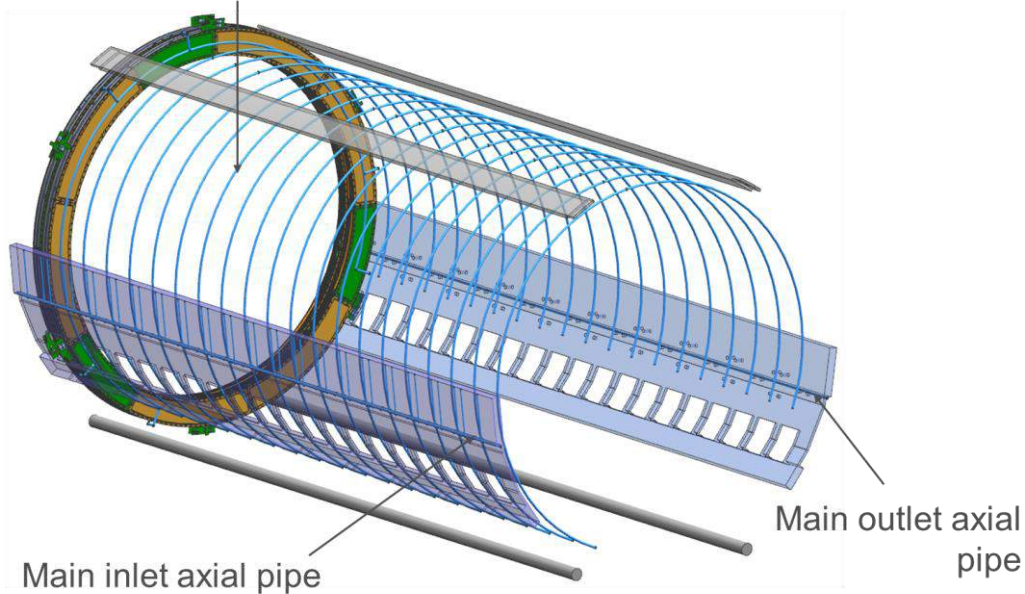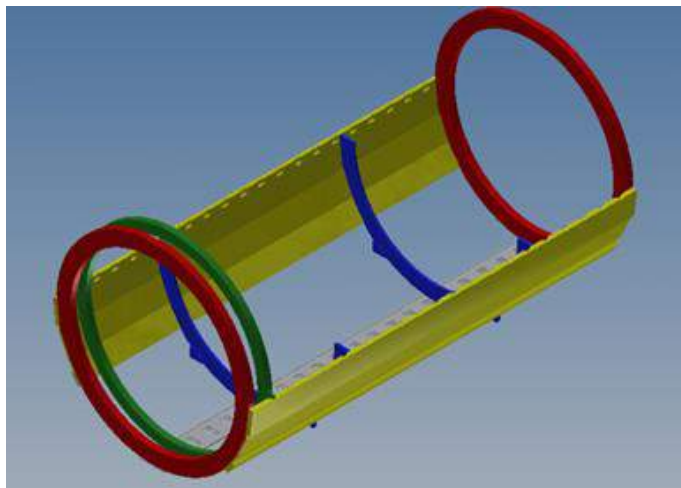
HV wire (simplified scheme)

T1: Conceptual design of electrical and gas system
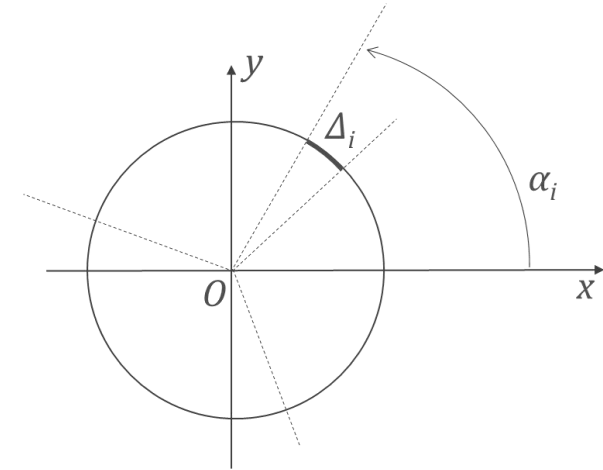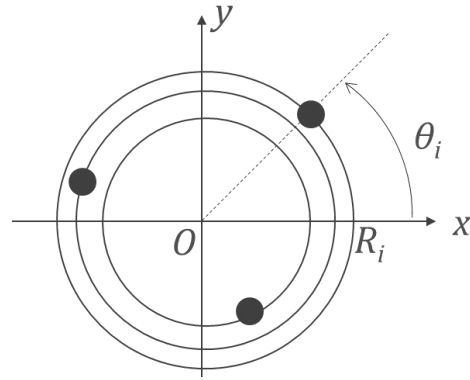

Stave

Space occupied by gas pipe

Space occupied by Key and HV cards

Circumferential pipes

Main inlet axial pipe

Main outlet axial pipe

T2: Analytical evaluation of mounting planes uncertainty

Ideal:
$\theta_1 = 30°$
$\theta_2 = 150°$
$\theta_3 = 270°$

Argonne:
$\theta_1 = 0°$
$\theta_2 = 180°$
$\theta_3 = 270°$
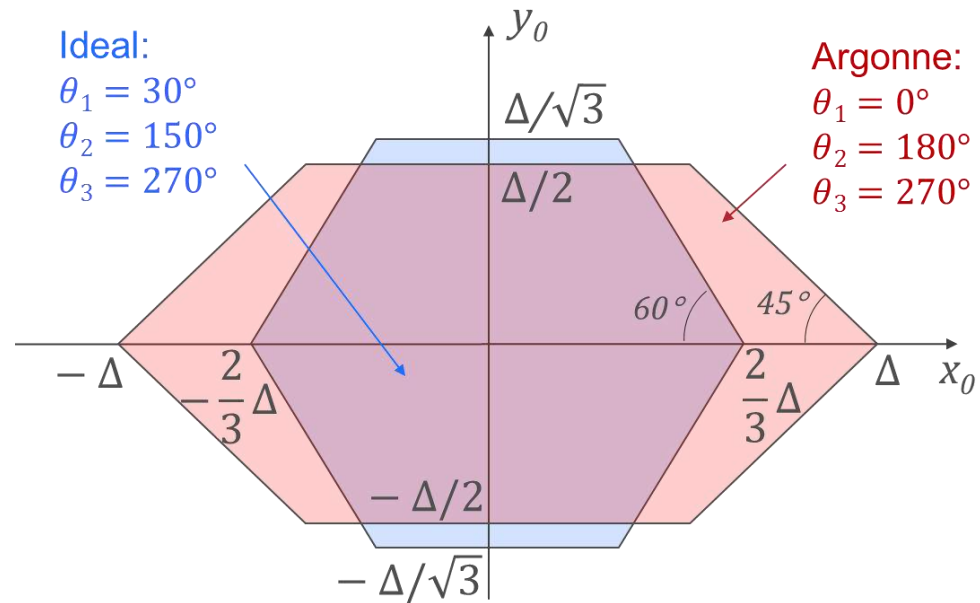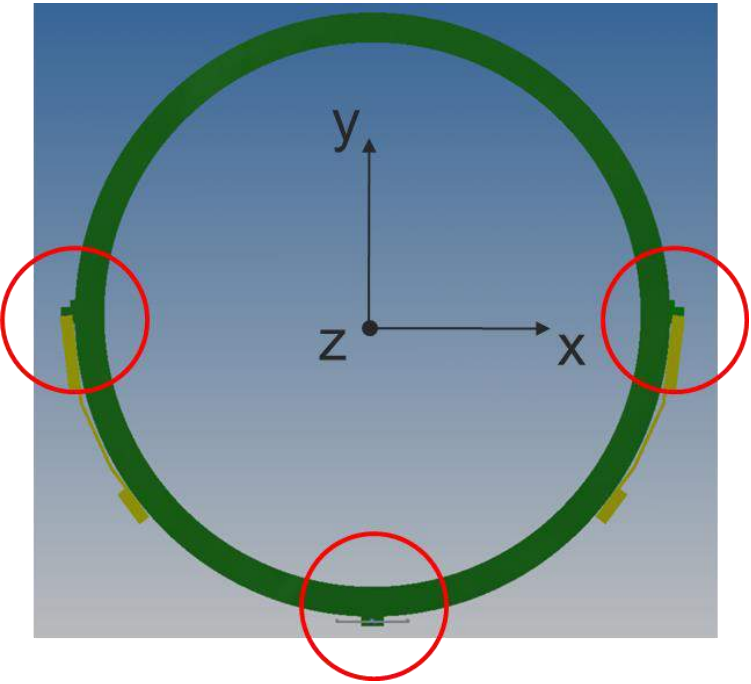
T3: Planes contact pressure analysis

R_s = 9.525 mm

R_{cg} = 9.600 mm

(both stainless steel)

SF = 1.01 ✖

R_s = 9.525 mm (silicon-nitride ceramic ball)

R_{cg} = 9.600 mm (stainless steel, coated with WC)

SF = 2.91 ✔

R_s = 4.850 mm (silicon-nitride ceramic ball)

R_{cg} = 4.900 mm (stainless steel, coated with WC)

SF = 1.68 ✔

A tormented application

Dec '14: discover of Fermilab internship – not able to apply for ❌

27 Feb '16: transmission of required documents to Dr. Donati 🤞

7 Mar '16: interview with Dr. Donati 🤞

20 May '16: deadline for acceptance – no piece of news 😪

27 May '16: Dr. Donati's call – acceptance
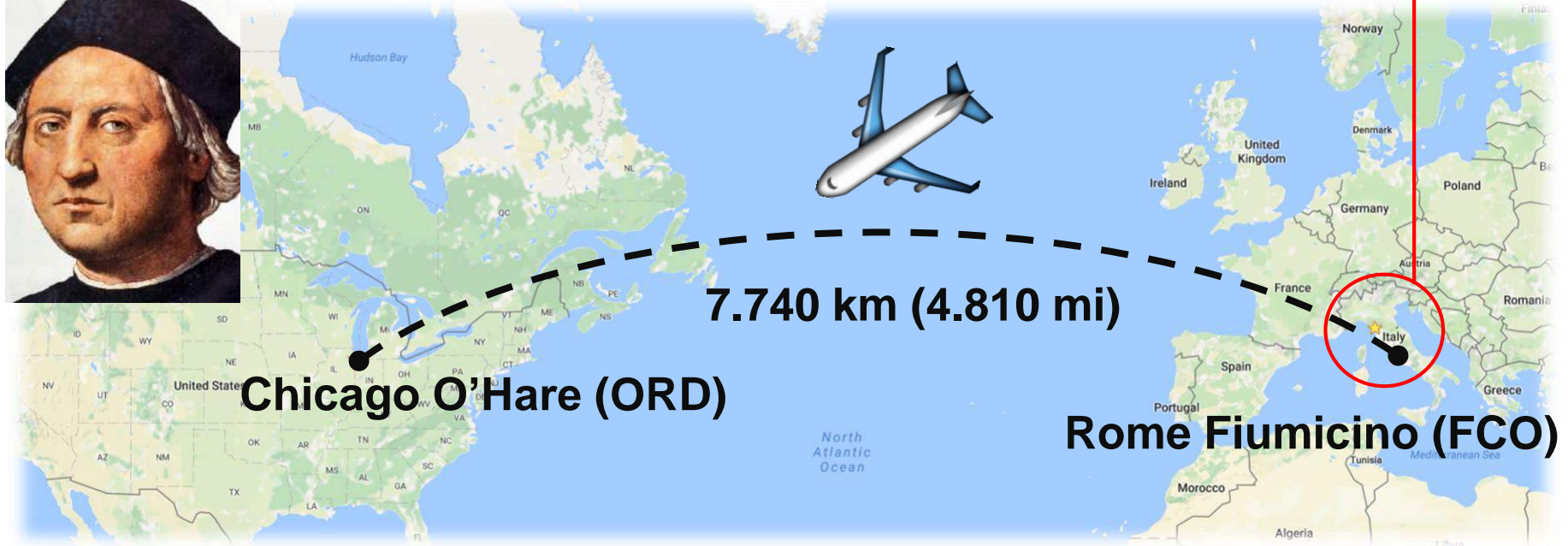
22 Jul '16: last night in Rome 🇮🇹

23 Jul '16: welcome to United States of America 🇺🇸
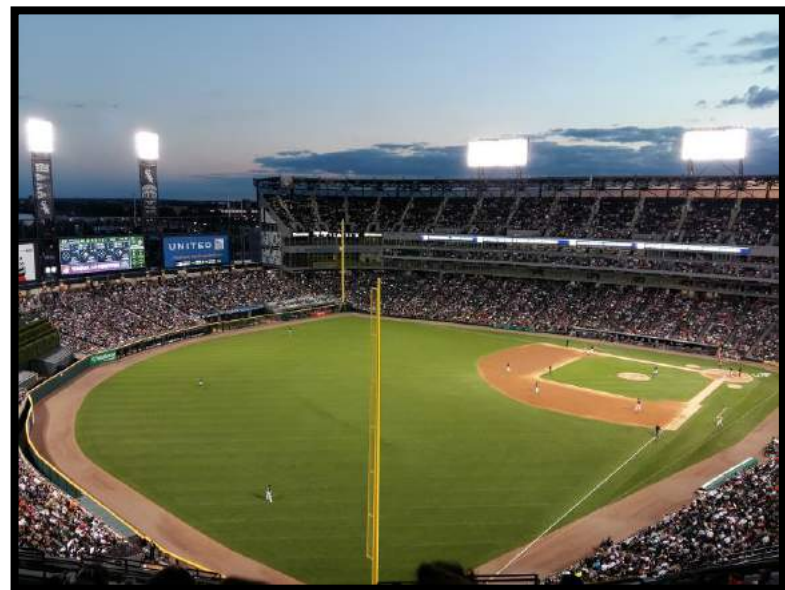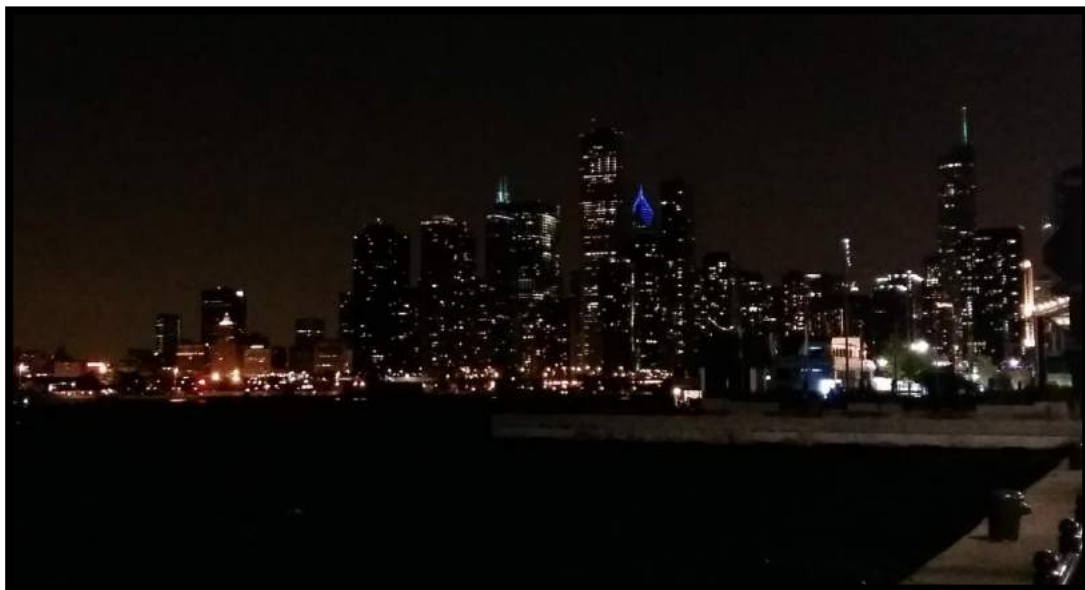
Making for the New World

My first time to USA

Camaiore (LU)

290 km (180 mi)

Rome

7.740 km (4.810 mi)

Chicago O'Hare (ORD)

Rome Fiumicino (FCO)

Fermilab

Chicago

Weekend main trips

Taliesin East (Spring Green)

Milwaukee

New York

Green Bay

My piece of advice is to … try and go!

Thank you for your attention!