Muon Technical Advisory Committee
March 2006

Spokespersons Introduction

Steve Geer

OUTLINE

- Collaboration Organization
- Comments on Collaboration Activities

Talks can be found: http://mice.iit.edu/mutac06/

Collaboration Web page:

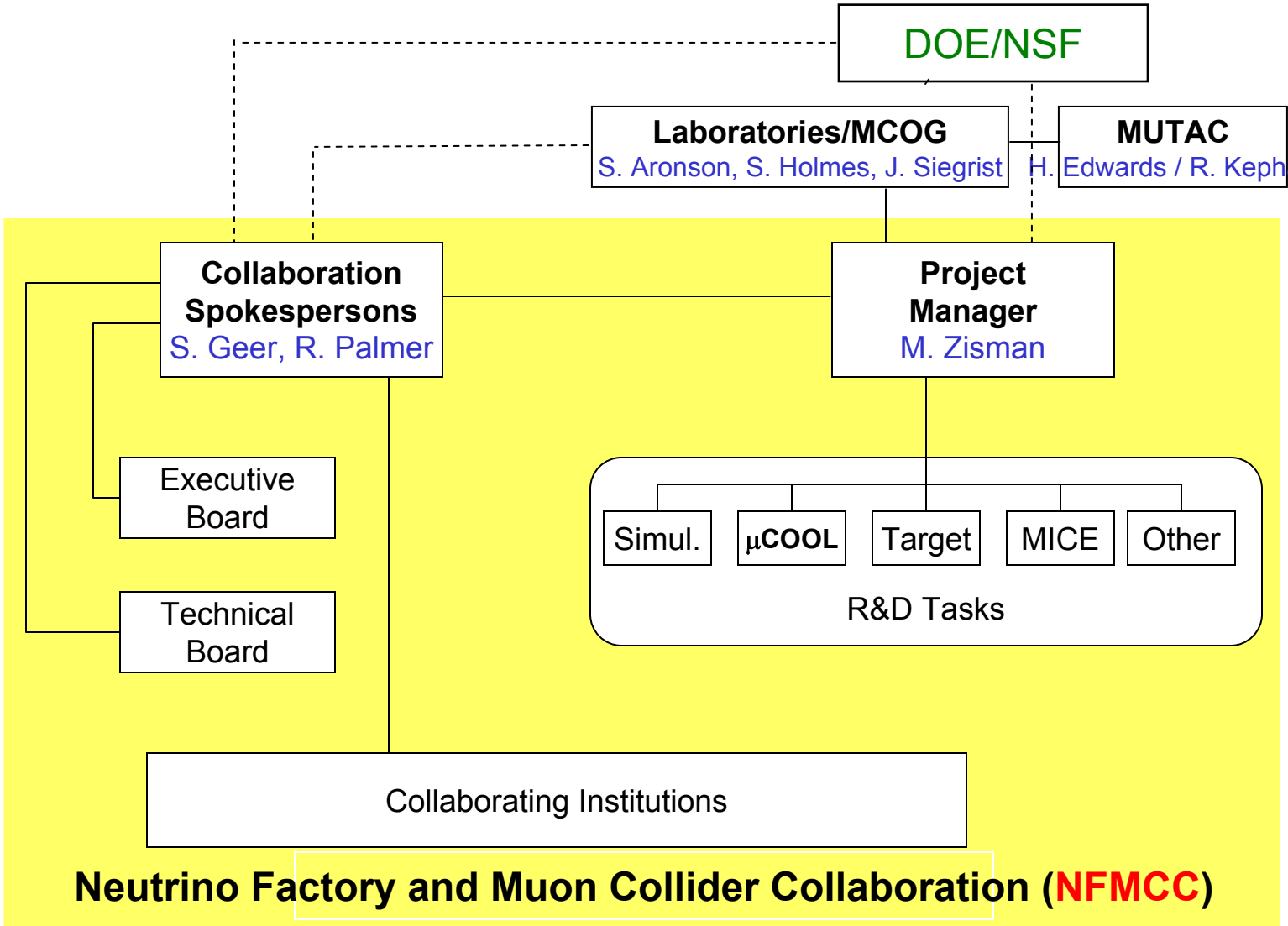
http://www.cap.bnl.gov/mumu/mu_home_page.html

MISSION

The collaboration is governed by a charter which defines its goals and organization. The goals are defined :-

> "*To study and develop the theoretical tools and the software simulation tools, and to carry out R&D on the unique hardware, required for the design of Neutrino Factories and Muon Colliders.*"

ORGANIZATION



- 135 scientists & engineers
- 6 US Labs
- 17 US Universities
- 14 Non-US Institutions

ORGANIZATION – Executive Board

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Main NFMCC Activities

Target R&D	→ MERIT Experiment:
Ionization Cooling R&D	→ MUCOOL/MICE
Simulations/Theory	→ Neutrino Factory Studies → ISS → Steady work on Muon Collider design

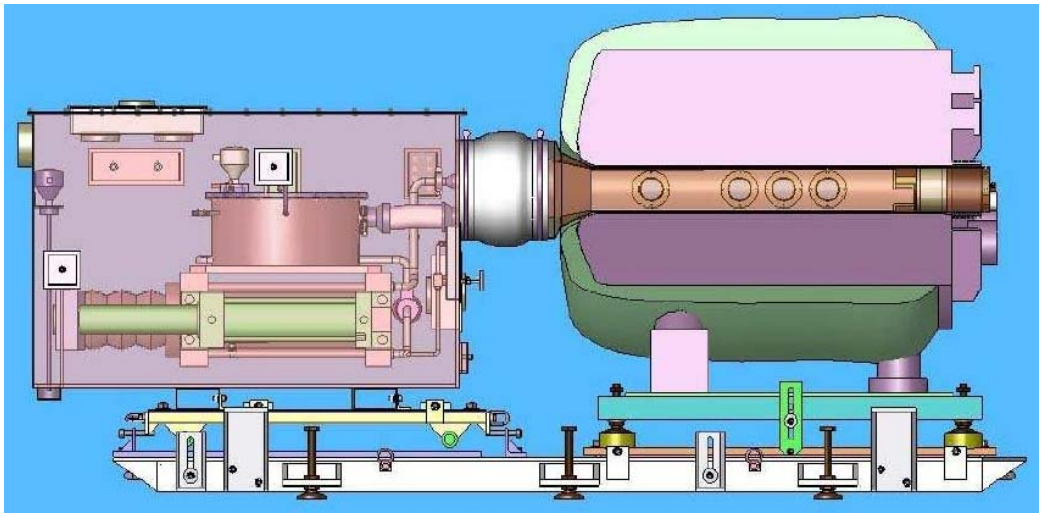
- MUCOOL Spokesperson: A. Bross
- Targetry Leaders: K. McDonald, H. Kirk
- Simulation/Theory/Design coordinator: R. Fernow

NFMCC Related Meetings

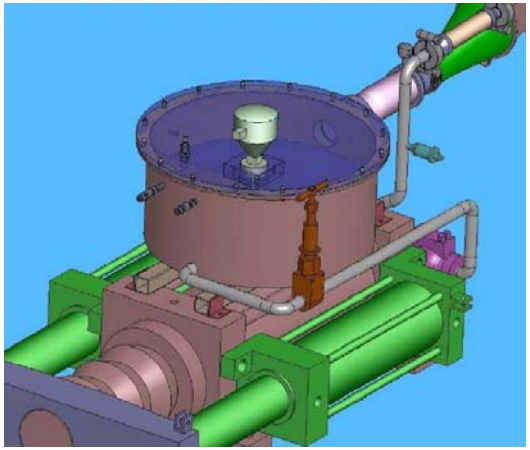
NFMCC Meeting	LBNL	Feb 14-17 2005
FFAG Workshop	FNAL	April 3-7 2005
MUTAC	LBNL	April 25-26 2005
International Scoping Study Organization	ICL	May 6-7 2005
4th International NUFACT School	Capri	June 12-20 2005
NUFACT05	Frascati	June 21-26 2005
MICE Collaboration Meeting	Frascati	June 26-29 2005
1st International Scoping Study (ISS)	CERN	Sept 22-24 2005
High Power Targetry Workshop	Oak Ridge	Oct 10-14 2005
MICE Collaboration Meeting	RAL	Oct 22-24 2005
FFAG05	Osaka	Dec 4-10 2005
MERIT Review	BNL	Dec 12 2005
ISS Machine Group	BNL	Dec 13-17 2005
2nd ISS Meeting	KEK	Jan 23-25 2006
Low Emittance Muon Collider	FNAL	Feb 6-10 2006
MICE Collaboration Meeting	Osaka	Feb 23 – Mar 3 2006
NFMCC Meeting	IIT	Mar 12-15 2006
MUTAC	FNAL	Mar 16-17 2006
3RD ISS Meeting	RAL	April 24-23 2006
MICE Collaboration Meeting	FNAL	June 8-11 2006
MICE Collaboration Meeting	RAL	Oct 8-11 2006

MERIT Target Experiment

- One year from beam
- Hardware becoming real



20 m/s Hg-jet system

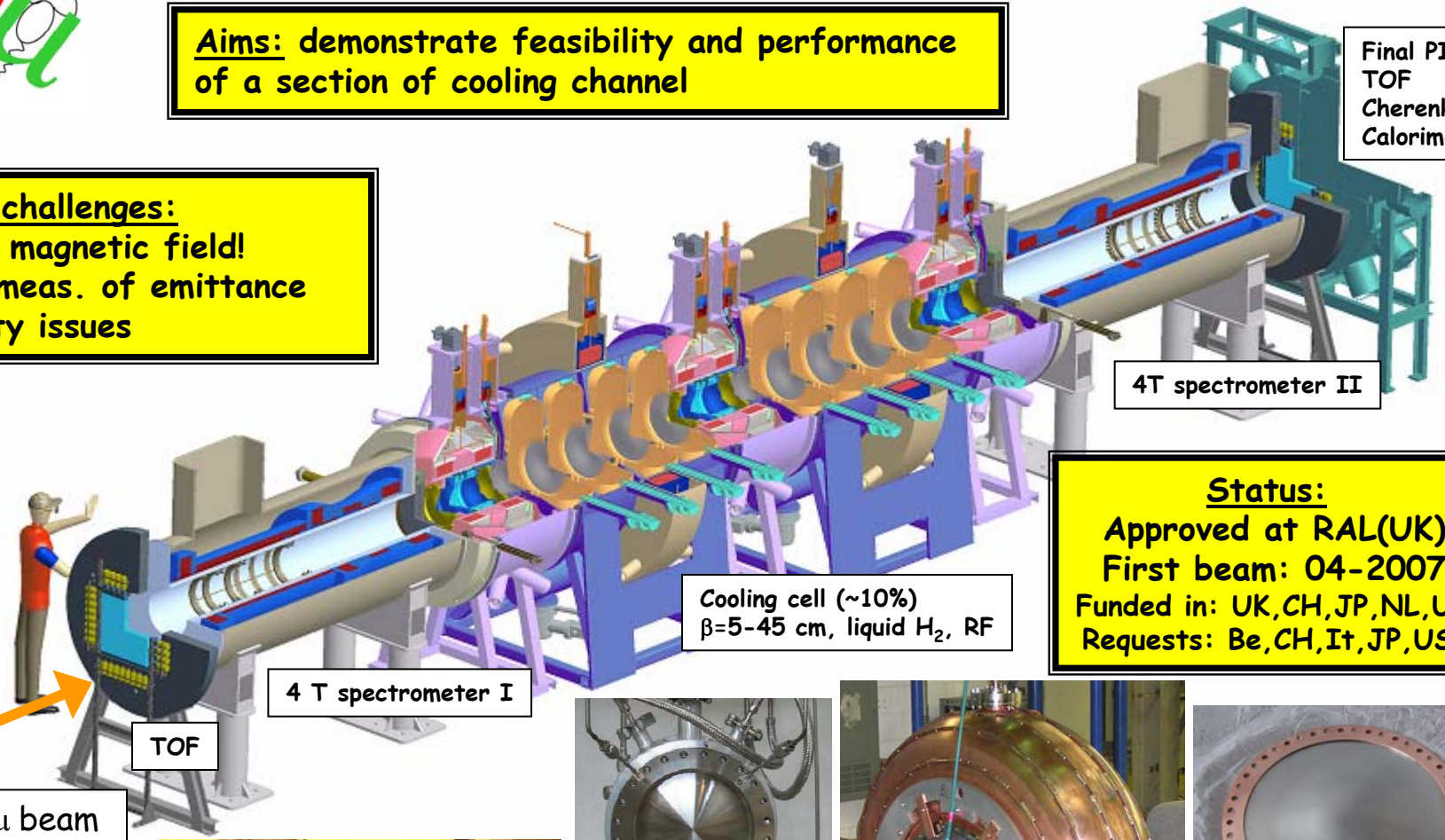


15T pulsed solenoid

Muon Ionization Cooling Experiment

Aims: demonstrate feasibility and performance of a section of cooling channel

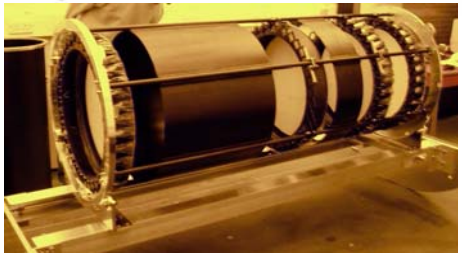
Main challenges:
RF in magnetic field!
10^{-3} meas. of emittance
Safety issues



Status:
Approved at RAL(UK)
First beam: 04-2007
Funded in: UK,CH,JP,NL,US
Requests: Be,CH,It,JP,US

Single-μ beam
~200 MeV/c

Some prototyping:



Scintillating-fiber tracker

MUCOOL Liquid-hydrogen absorber

MUCOOL 201 MHz RF cavity with beryllium windows

Simulation/Design/Theory

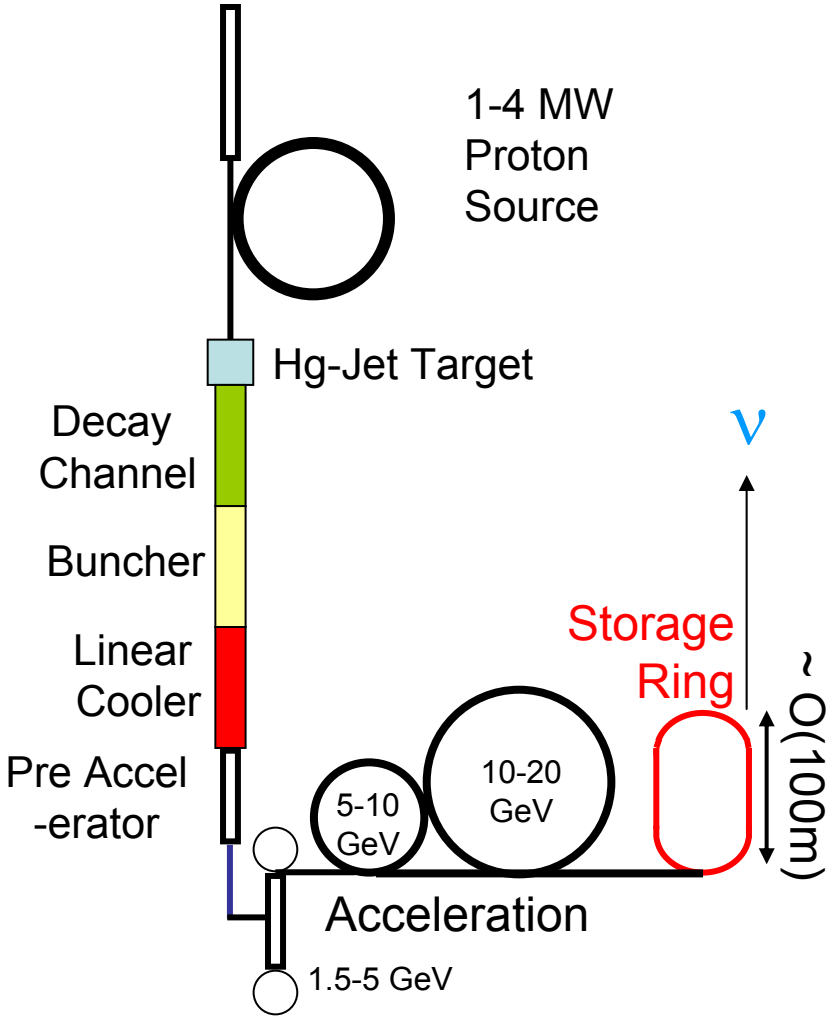
The International Scoping Study is an important activity for us. We must make sure it is successful, and that it leads to a "World Design Study" → HIGH PRIORITY

There have been promising developments in design ideas for the cooling for a Muon Collider (Muons Inc and Bob et al). Perhaps this is a breakthrough (?) → ENTHUSIASM & CONTINUED STEADY WORK

One great thing about the recent Muon Collider developments is that the pre-cooling front ends for Muon Collider and Neutrino Factory are now THE SAME !

Neutrino Factory Ingredients

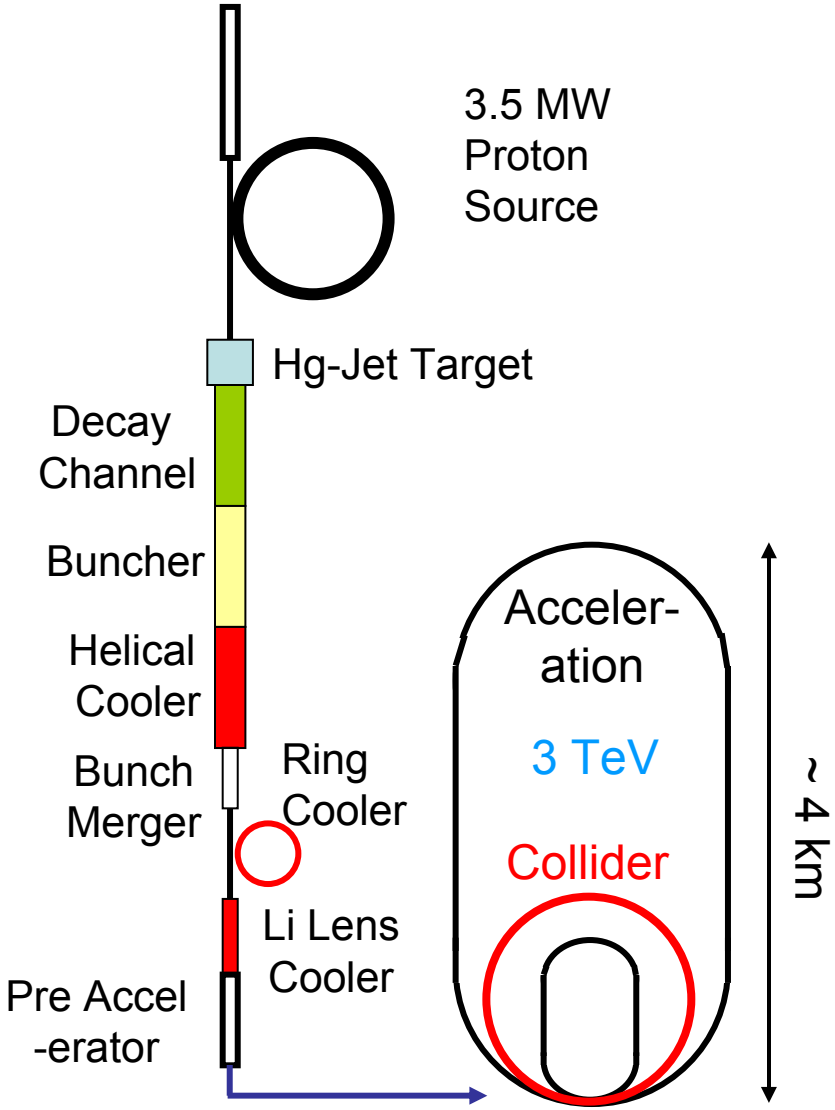
- Proton Driver
  - primary beam on production target
- Target, Capture, and Decay
  - create π; decay into μ
- Bunching & Phase Rotation
  - reduce ΔE of bunch
- Cooling
  - reduce transverse emittance
- Acceleration
  - 130 MeV $\rightarrow$ 20 GeV
- Storage Ring
  - store for 500 turns; long straight section



US Design schematic

Muon Collider Ingredients

- Proton Driver
  - primary beam on production target
- Target, Capture, and Decay
  - create π; decay into μ
- Bunching & Phase Rotation
  - reduce ΔE of bunch
- Cooling
  - reduce 6D emittance
- Acceleration
  - 130 MeV $\rightarrow$ up to 1.5 TeV
- Storage Ring
  - store for ~1000 turns
  - One IP



Finally

We are progressing along our foreseen R&D path.

MERIT and MICE are being realized … they are both only 1 year away from beam

Mike will tell you (next talk) funding is tight & we have a lot to do … so we have to stay focused and a little more support would really help.

Despite tight funding, we are making steady progress with both hardware projects (its great to be back in action with the rf R&D) and design studies (its great to see the ISS progressing and progress with Muon Collider cooling channel design)