Introduction to Case Study

- **Please get ready to leave in 10 minutes…** your groups will be called!

- A **group study exercise** on a Case Study, with the following objectives…
  - (i) to learn by actively tackling a problem
  - (ii) to meet and network with new colleagues
  - (iii) **final presentation session** to present and discuss **your** work!

- **No right or wrong answers!!!**
  - keep it simple… there is no single solution!
  - ideas and discussion are encouraged, or rather, are mandatory ;)

Location

- Let's distribute ourselves close to the Central Courtyard at the ***Isidor I. Rabi Institute*** (your check-in point!) for easy access to tutors:
  - in the Breakfast Room and adjacent rooms… CAS students in 2013:

Schedule

- 1 hour introduction, 7 hours group work including 2 hours preparation before a **2 hour final presentation and discussion session**

DRAFT PROGRAMME FOR BEAM INJECTION, EXTRACTION AND TRANSFER SCHOOL
Erice, Sicily, 10-19 March, 2017

Time	Friday 10 March	Saturday 11 March	Sunday 12 March	Monday 13 March	Tuesday 14 March	Wednesday 15 March	Thursday 16 March	Friday 17 March	Saturday 18 March	Sunday 19 March
09:00		Opening Talks	Overview of Injection & Extraction Techniques	Timing, Synchronisation & Longitudinal Aspects I	Kicker Magnets I		Emittance Preservation	Beam Instrumentation	Transfer Line Design, Matching and Design Tools II	
09:50			B. Goddard	H. Damerau	M. Barnes		V. Kain	P. Forck	W. Bartmann	
10:00	A	Review of Transverse Beam Dynamics I	Injection: Electron Beams	Magnets and Special Magnets	Kicker Magnets II		Septa I	Secondary and Radioactive Beams	Exotic Injection and Extraction Methods	D
10:50	R	B. Holzer	M. Aiba	C. Muehle	M. Barnes	E	M. Paraliev	H. Weick	B. Goddard	E
11:00	R	COFFEE	COFFEE	COFFEE	COFFEE	X	COFFEE	COFFEE	COFFEE	P
11:30	I	Review of Longitudinal Beam Dynamics	Injection: Hadron Beams	Timing, Synchronisation & Longitudinal Aspects II	Single and Multi-Turn Extraction	C	Septa II	Low Energy Beam Transport	Transfer Line Design, Matching and Design Tools III	A
12:20	V	F. Tecker	C. Bracco	H. Damerau	M. Fraser	U	M. Paraliev	R. Baartman	W. Bartmann	R
12:30	A	LUNCH	LUNCH	LUNCH	LUNCH	R	LUNCH	LUNCH	LUNCH	T
14:30	L	Review of Transverse Beam Dynamics II	Phase Space Painting and H-Stripping Injection		Resonant Extraction	S	Optics Measurement Techniques for Transfer Lines I	Transfer Line Design, Matching and Design Tools I	**Seminar** Injection into a Trap	U
15:20	D	B. Holzer	B. Goddard	F R E E	P. Bryant	I	P. Forck	W. Bartmann	F. Herfurth	R
15:30	A	Particle Interactions with Matter	Introduction to Case Study		**Seminar** Extraction Techniques for Medical Beams	O	Optics Measurement Techniques for Transfer Lines II	Machine Protection and Activation	Case Study Presentations	D
16:20	Y	A. Lechner		A	P.Bryant	N	P. Forck	A. Nordt		A
16:30		TEA	TEA	F	TEA		TEA	TEA	TEA	Y
17:00		Recap. of Electromagnetism	Injection and Extraction in Cyclotrons	T E R N O O N	Case Study		Case Study	Case Study Preparation	Case Study Presentation	
17:50		U. Van Rienen	M. Seidel							
18:00		Recap. Of Relativity and Space Charge	Case Study		Case Study		Case Study	Case Study Preparation	Outlook: Physics beyond the Standard Model	
18:50		M. Ferrario								
20:00		DINNER	DINNER	DINNER	DINNER		DINNER	Special Dinner	DINNER	

Introduction to Tutors

- We have an excellent student-to-tutor ratio at the school with 9 tutors here all week, so be sure to **get the tutors involved** in discussion:
  - **Masamitsu** Aiba
  - **Roger** Bailey (replaced later in the week by **Hermann** Schmickler)
  - **Wolfgang** Bartmann
  - **Chiara** Bracco
  - **Phil** Bryant
  - **Matthew** Fraser
  - **Brennan** Goddard
  - **Christoph** Hessler
  - **Bernhard** Holzer
- The following tutors are here for some part of the week:
  - **Mike** Barnes, **Heiko** Damerau, **Verena** Kain, **Anton** Lechner, and other lecturers too!

Groups and Case Studies

- **12 groups** of **5 - 6 students** have been pre-selected:
  - **Case Study guidance notes** uploaded on the Indico Timetable, along with a **list of the groups**: http://indico.cern.ch/event/451905/timetable/
- Groups 1 – 3:
  - **Case Study A**: *Design a top-up injection system for an high-energy circular collider, e.g. FCC-ee (~ 100 GeV)*
- Groups 4 – 6:
  - **Case Study B:** *Design an injection system for a synchrotron light source, e.g. SLS (~ few GeV)*
- Groups 7 – 9:
  - **Case Study C:** *Design an injection system for an high-energy circular collider, e.g. FCC-hh (~ few TeV)*
- Groups 10 – 12:
  - **Case Study D:** *Design a fast extraction system for an high-energy circular collider, e.g. FCC-hh (~ 50 TeV)*

Presentation Session

- We will we conclude the Case Study with a **presentation session** where your will present **your** work, where we **learn and discuss** each other's ideas (good and bad!)

- Each group's presentation and discussion will be < 10 minutes so aim for just a few slides (**5 maximum!**)
  - 12x 10 mins = 2 hours is already over the limit, so we have to be strict on time!

- Please **take care of the workload**... and your colleagues…
  - try to share different roles and responsibilities equally!

Any questions?!

- Thanks to **Masamitsu Aiba, Wolfgang Bartmann, Brennan Goddard, Linda Stoel** and **Christoph Wiesner** as well as **Bernhard, Roger** and **Barbara** for their help!

- Good luck in finding your group and see you back at the ***Isidor I. Rabi Institute*** in a few minutes!

- If you are experiencing any problems, please just come and see me, or any of the organizers, or send me a mail: mfraser@cern.ch

Group **1**: Case Study **A**

Group 1	**Case Study A**
Mariusz Sapinski	GSI
Aurelio Berjillos Barranco	CERN
Olaf Dressler	Helmholtz-Zentrum Berlin
Irina Avvakumova	JINR
Nicholas Evans	Oak Ridge National Laboratory
Helen Barminova	National Research Nuclear University MEPhI

Group **2**: Case Study **A**

Group 2	**Case Study A**
Christoph Wiesner	CERN
Shuang Ruan	Chinese Academy of Sciences
Johannes Bernhard	CERN
Dmitriy Berkaev	BINP SB RAS
Michaela Schaumann	CERN
Szymon Myalski	EBG MedAustron GmbH

Group **3**: Case Study **A**

Group 3	**Case Study A**
Andrey Zhuravlev	BINP
Eric Veyrunes	CERN
Davide Reggiani	PSI
Grazia D'Agostino	INFN-Laboratori Nazionali del Sud
Annie Ringvall Moberg	CERN
Wolfgang Geithner	GSI Helmholtzzentrum für Schwerionenforschung

Group **4**: Case Study **B**

Group 4	**Case Study B**
Linda Stoel	CERN
Samira Kasaei	Institute for Research in Fundamental Sciences (IPM)
Salim Ogur	CERN
Claudio Di Giulio	INFN-LNF
Daniel Barna	Wigner Research Centre for Physics
Nikolaos Charitonidis	CERN

Group **5**: Case Study **B**

Group 5	**Case Study B**
Miroslav Georgiev Atanasov	CERN
Tomas Matlocha	NPI of the CAS
Olha Kazinova	Joint Institute for Nuclear Research
Roberto Formento Cavaier	Centre National de la Recherche Scientifique (FR)
Jean-Francois Comblin	CERN
Daniel Valuch	CERN

Group **6**: Case Study **B**

Group 6	**Case Study B**
Giulia Romagnoli	CERN
Vera Chetvertkova	GSI
Tim Winkelmann	Heidelberg Ionenstrahl-Therapie Centrum (HIT)
Janne Holma	CERN
Salvatore Danzeca	CERN
Pierre Salou	Pantechnik

Group **7**: Case Study **C**

Group 7	**Case Study C**
Janet Schmidt	CERN
Lina Sheng	Chinese Academy of Sciences
Athanasios Topaloudis	CERN
Patrick Alexandre	Synchrotron SOLEIL
Raymond Veness	CERN
Andrei Martynov	Joint Institute for Nuclear Research (JINR)

Group **8**: Case Study **C**

Group 8	**Case Study C**
Gian Piero Di Giovanni	CERN
Bo Wu	Chinese Academy of Sciences
Keith Furutani	Mayo Clinic Rochester
Agnieszka Chmielinska	CERN
Zahra Rezaei	LAL (Laboratoire de l'Accélérateur Linéaire, Orsay, France) and Arak Universiy,Arak,Iran

Group **9**: Case Study **C**

Group 9	**Case Study C**
Marco Garattini	CERN
Sergey Litvinov	GSI
Alejandro Sanz Ull	CERN
Jingjing Zhang	Chinese Academy of Sciences
Irina Shreyber-Tecker	CERN
Giovanni Franzini	INFN-LNF

Group **10**: Case Study **D**

Group 10	**Case Study D**
Vincenzo Forte	CERN
Oliver Stein	CERN
Georges-Henry Hemelsoet	CERN
Nuria Ayala Cintas	ALBA Synchrotron Light Source
Luca Gennaro Foggetta	INFN-Laboratori Nazionali di Frascati
Lorena Vega	CERN

Group **11**: Case Study **D**

Group 11	**Case Study D**
Marc Delrieux	CERN
Alexander Pryanichnikov	Physical Technical Center of P.N. Lebedev Physical Institute of the Russian Academy of Sciences
Kajetan Fuchsberger	CERN
Carolina Belver-Aguilar	CERN
Luigi Salvatore Esposito	ADAM

Group **12**: Case Study **D**

Group 12	**Case Study D**
Vasileios Vlachodimitropoulos	CERN
Oscar Roberto Blanco Garcia	LNF/INFN
Tadas Didvalis	LSMU
Greta Guidoboni	CERN
Jérémie Bauche	CERN
Andrea De Franco	EBG MedAustron GmbH