

# CAS case study

## MFNF - My First Neutrino Factory

Iratxe Ariz, Kevin Li, Hugo Pereira, Jerzy Swiniarski

May 31, 2011

# Why do we care about $\nu$ ?

- The quest for exploring the nature of our origin has been an ever important driving force for the development of man kind
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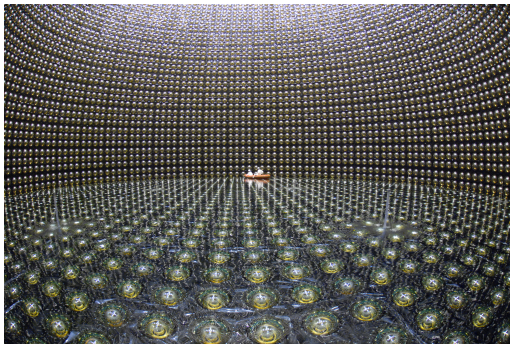
1345: Notre Dame



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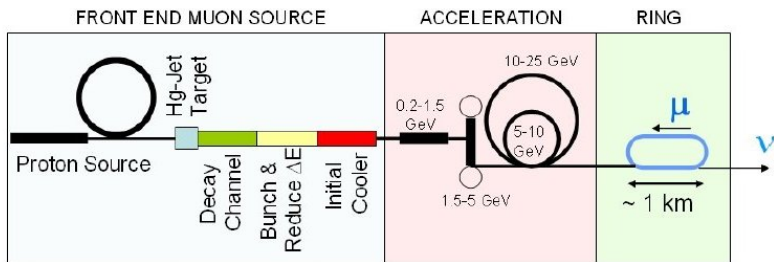
1996: Super Kamiokande



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## 2011: the CAS $\nu$ -factory



# High power proton driver - high $\nu$ -flux

## Specifications

Pulse length	5 bunches of 3 ns rms
Repetition rate	60 Hz
Beam power	4 MeV
Beam energy	2-8 GeV
Primary particle	H <sup>-</sup>

## Current specifications

4 MW beam at 6 GeV and 60 Hz

- $0.14 \times 10^{14}$  protons per bunch
- 11.1 mA ms in 16.7 ms
- average current 0.67 mA at 100% duty cycle
- average current 5.00 mA at 13.3% duty cycle

⇒ SCL (CW) for acceleration from 2.5 MeV-6 GeV

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# Machine layout



## RF structures

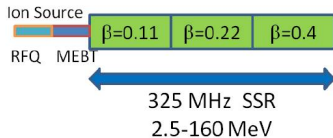
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SSR0	0.114	325	Spoke	26	6	0.6	2.5-10
SSR1	0.215	325	Spoke	18	7	1.1	10-32
SSR2	0.420	325	Spoke	44	9	1.3	32-160
LE650	0.610	650	Elliptic	42	16	1.7	160-500
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ILC	1.000	1300	Elliptic	288-144	17-34	1.5	2000-6000

<sup>a</sup> $f$  [MHz], Gradient [MV/m],  $Q$  [ $10^{10}$ ], Energy [MV]

⇒ Layout which is simple but can be expensive! How to finance?



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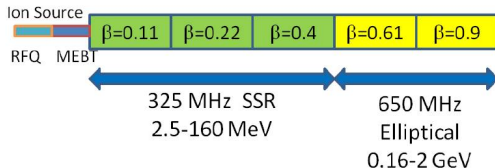
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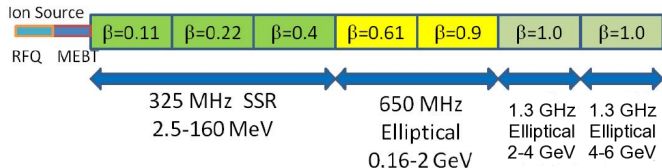
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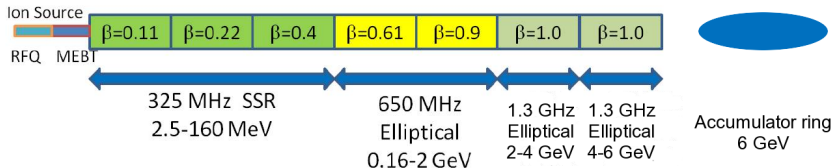
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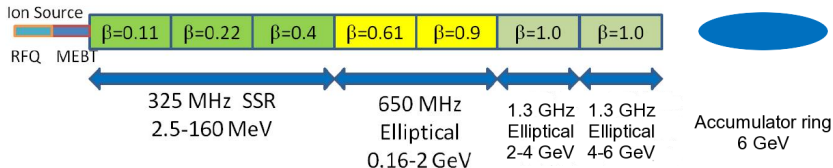
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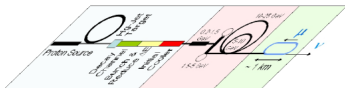
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# Sustainability - site study

Move site near London/New York/Oslo and include the possibility for HNWI's (high net worth individuals) to actively participate in improving our future by research progress

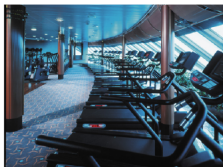
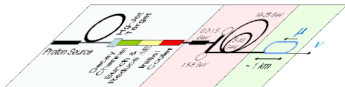
- Posh environment
- High member fees
- Feed generated power directly into the power supply circuit
- Members will explicitly be mentioned in the facilities year report



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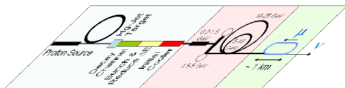
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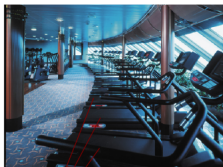
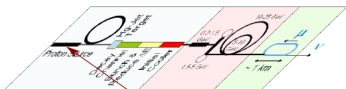




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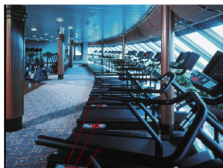
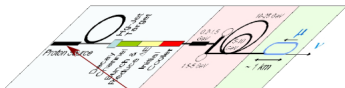


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End

Thank You!

Contact details:

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