

“Gruppo Collegato di Brescia”



anagrafica 2015

ASACUSA Italia (per 2015)

cognome nome		TIPO	Ricercatori	Tecnologi	FTE
Artoni Maurizio	assoc	Prof.Associato			30
Bianconi Andrea	assoc	Prof.Associato			70
Corradini Maurizio	assoc	Ricercatore			100
Ferroni Matteo	assoc	Ricercatore			50
Leali Marco	assoc			x	100
Lodi Rizzini Evandro	assoc				
xxxxxxxxxx		Assegnista			100
Venturelli Luca	assoc	Prof. Associato			100
Zurlo Nicola	assoc	Ricercatore			100
tecnico					

Marca Alessandro		tecnico informatico			100

NINPHA (per 2015)

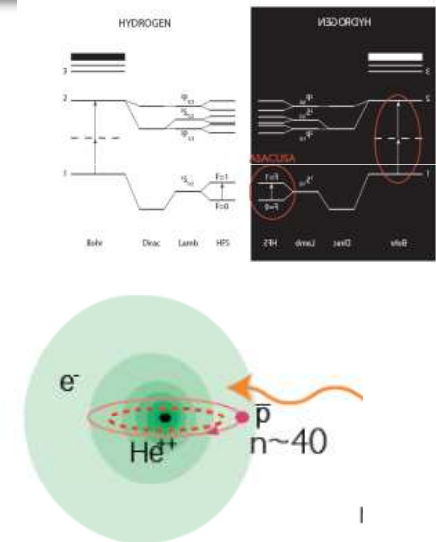
cognome nome		TIPO	Ricercatori	Tecnologi	FTE
Bianconi Andrea	assoc	Prof.Associato			30

ASACUSA Goals



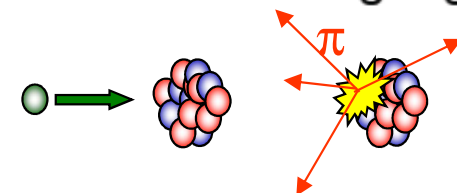
Studies of *CPT* symmetry by atomic spectroscopy

- 1) • Microwave spectroscopy of antihydrogen :
→ Ground-state hyperfine structure with 10^{-6} precision.
- 2) • Two-photon laser spectroscopy of antiprotonic helium
→ **Antiproton mass** with $<10^{-10}$ precision.



Nuclear collisions with antiprotons

- 3) • **total annihilation cross-section σ** , at 5 MeV completed. 0.1 MeV ongoing.

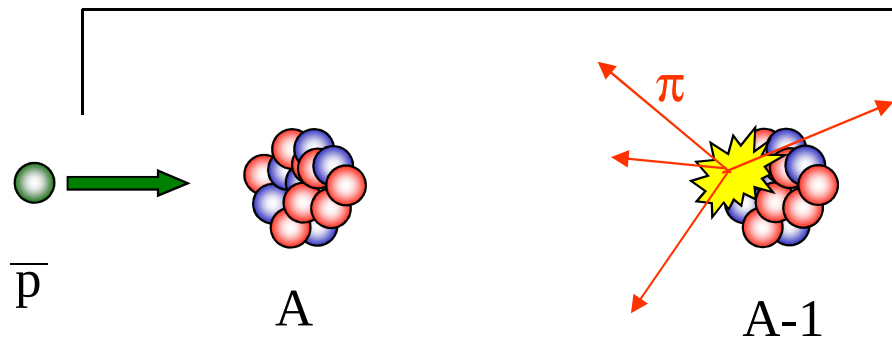


“ASACUSA” richieste finanziarie 2015

	keuro	di cui s.j
MISSIONI (AD→26 weeks: 5Jun-18Dec)		
Prese dati (Hbar & pbar-He) CERN 1.2 FTE x 17 weeks	20.5	
Prese dati (sigma_ann) CERN 4 FTE 3 weeks	12	
Installazione apparato CERN 3 FTE 1 weeks	3	
Riunioni di Collaborazione+viaggio Monaco	3	

TOT	38.5	35
TRASPORTI	1	
CONSUMO		
bersagli ultrasottili (grafene?)	2	2
piccolo rivelatore ad anello a fibre scintillanti	2	
SPSERVIZI		
common fund	10	

TOT	53.5	37



Future measurements: 2015

Measurement of the **absolute annihilation σ** for C, Pd, Pt at 130 keV

targets:

C (70 nm)
 C (100 nm)
 C (130 nm)



To check $N_{events} \approx \Delta x$

C(70 nm)+Pd(10 nm)

C(70 nm)+Pt(5 nm)

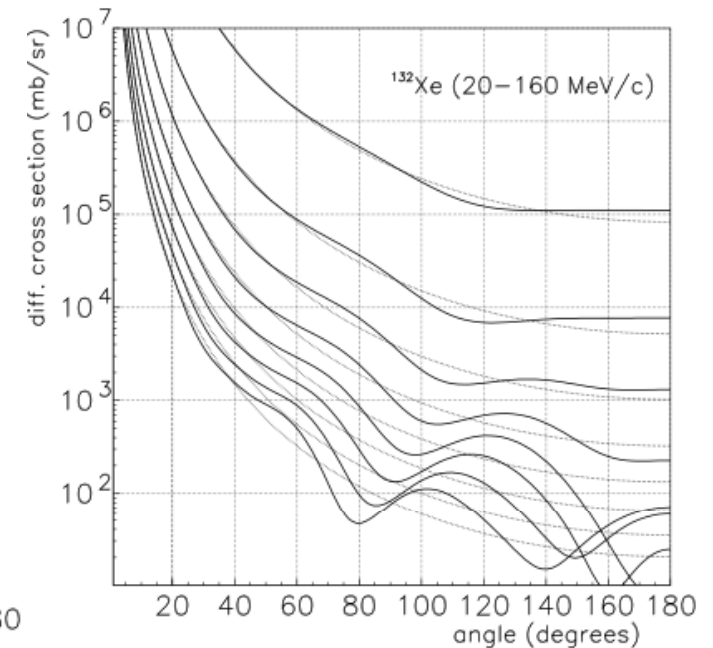
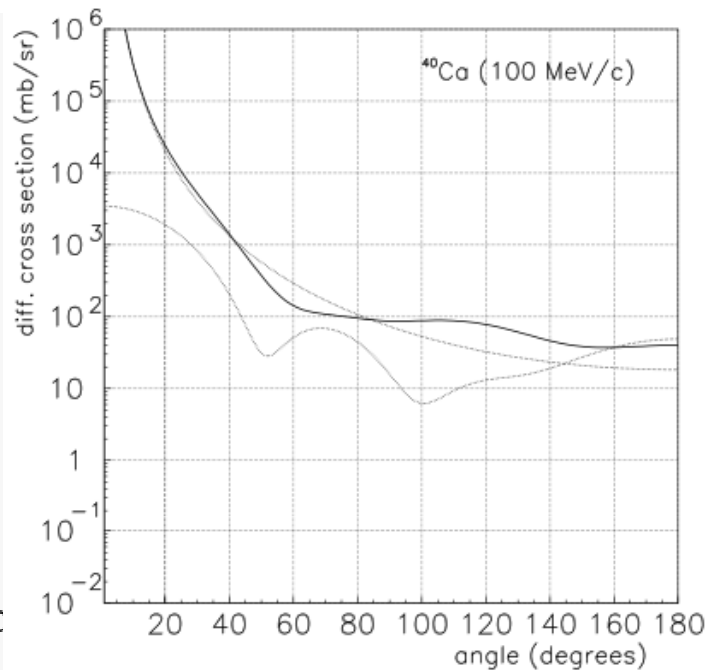
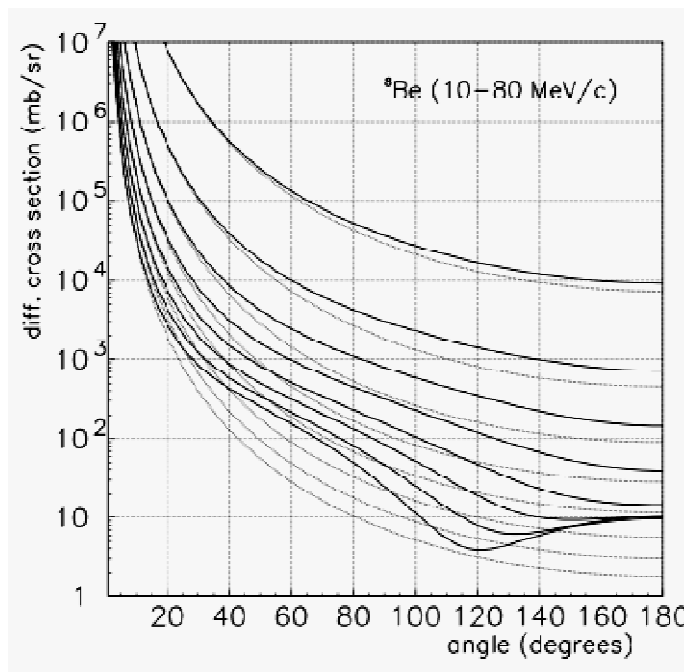
+ “empty targets” (frame-only)

+ targets & 2°-frame

2-3 weeks needed

Elastic Nuclear σ (2016?)

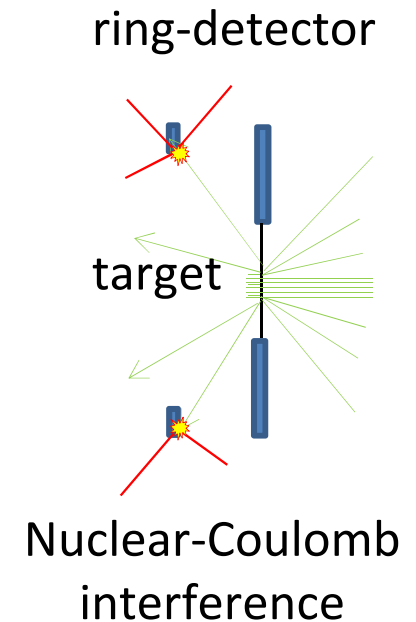
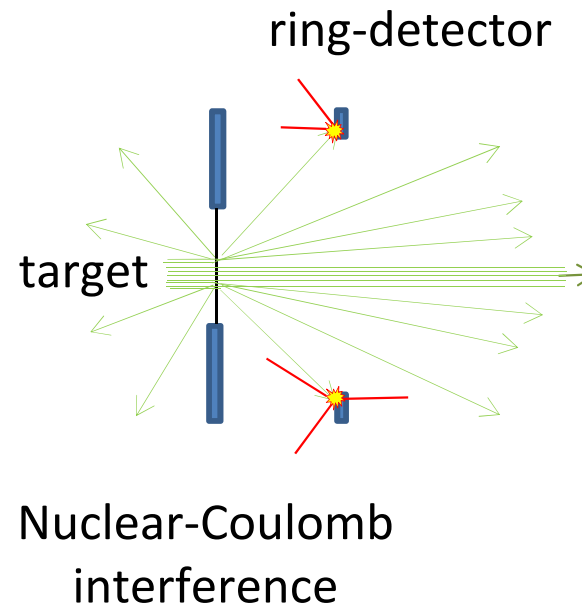
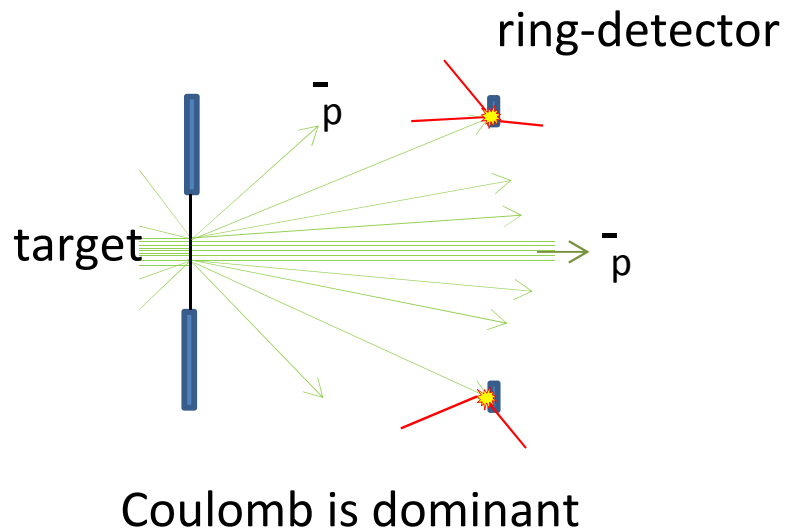
- No existing pbar data at low-energies
- Calculations (by A.Bianconi)



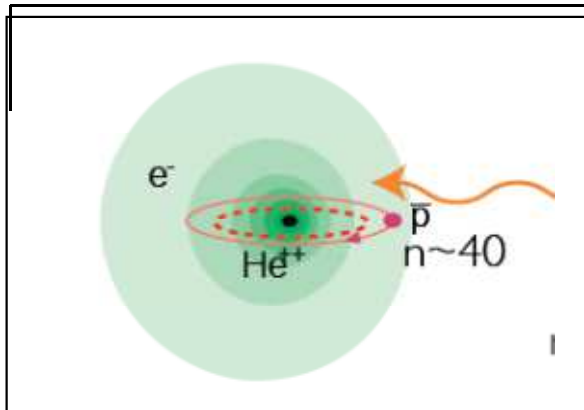
At forward angles (up to 20°) Rutherford is dominant

At large angles Nuclear-Coulomb interference is evident @ 5 MeV

Measurement of Nuclear Scattering σ at 5.3 MeV (2016?)



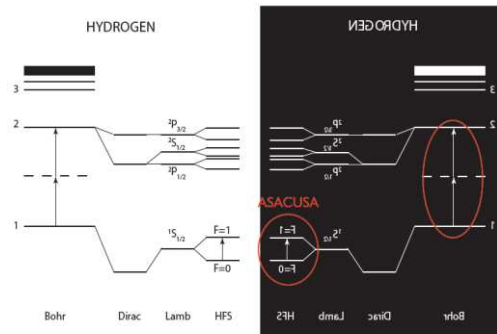
Measurement of the differential elastic cross-section
by scanning the distance of a ring from the target



Plans for 2014

$\bar{p}\text{He}$ 2-photon spectroscopy of 417 & 372-nm resonances at 1.5 K

- systematic studies -
target density & offset frequencies



Plans for 2015

Study and improve the beam features (Hbar numbers, temperature, n-states,...)

Introduce MW cavity

