



# NUMEN

**Determining the Nuclear Matrix Elements of Neutrinoless Double  
Beta Decays by Heavy-Ion Double Charge Exchange Reactions**

**Organization (January 2022)**

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## Participants

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## NUMEN sub-projects

<b>NUMEN PROJECTS</b>	<b>COORDINATOR COMPONENTS</b>	<b>FORESEEN ACTIVITY</b>
<b>SPOKESPERSON</b>	<b>F.Cappuzzello, C.Agodi</b>	Scientific responsibility; Interface with the external; NP coordination activities; Coordinating resources and collaborations; MAGNEX upgrade
<b>CROSS SECTION DATA</b>	<b>M.Cavallaro</b> <i>L.Acosta, C.Agodi, P.Amador-Valenzuela, I.Boztosun, G.A.Brischetto, S.Calabrese, D.Calvo, L.Campajola, F.Cappuzzello, D.Carbone, M.Cavallaro, E.R.Chávez Lomelí, I.Ciraldo, F.Delaunay, H.Dapo, L.M. Donaldson, C.Eke, P.Finocchiaro, S.Firat, M.Fisichella, M.A.Guazzelli, A.Hacisalihoglu, T. Khumalo, S.Koulouris, R.Linares, N.H.Medina, R.Neveling, J.R.B.Oliveira, A.Pakou, L.Pandola, L.Pellegrini, H.Petrascu, G.Russo, O.Sgouros, S.O.Solakci, V.Soukeras, G.Souliotis, A.Spatafora, D.Torresi, S.Tudisco, A.Yildirim, V.A.B.Zagatto</i>	Experiment set up; Facility optimization; Experiment shifts; Data taking <sup>a)</sup>
<b>DATA REDUCTION</b>	<b>D.Carbone, R.Linares</b> <i>C.Agodi, P.Amador-Valenzuela, G.A.Brischetto, S.Calabrese, F.Cappuzzello, D.Carbone, M.Cavallaro, I.Ciraldo, S.Firat, M.Fisichella, A.Hacisalihoglu, R.Linares, O.Sgouros, V.Soukeras, A.Spatafora, V.A.B.Zagatto</i>	Extraction of energy spectra and absolute cross sections
<b>FPD GAS TRACKER</b>	<b>M. Cavallaro, D.Torresi</b> <i>C.Agodi, I.Boztosun, G.A.Brischetto, L.Campajola, F.Cappuzzello, M.Cavallaro, I.Ciraldo, H.Dapo, F. Delaunay, M.Fisichella, E.M.Gandolfo, Y.Kucuk, L.Neri, R.Neveling, L.Pellegrini, R.Persiani, H.Petrascu, O. Sgouros, D.Torresi, A.Yildirim</i>	Design, building and test of the gas prototype and of the final tracker <sup>b)</sup>

<b>FPD PID SYSTEM</b>	<b>S.Tudisco, D.Carbone, P.Finocchiaro</b> <i>C.Agodi, G.A.Brischetto, S.Calabrese, L.Campajola, F.Cappuzzello, D.Carbone, M.Cavallaro, P.Finocchiaro, E.M.Gandolfo, G.Lanzalone, O.Sgouros, V.Soukeras, A.Spatafora, S.Tudisco</i>	Building prototypes and tests with SiC technology; Study of CsI technology for NUMEN PID; Construction of crystals and assembly with suitable read-out systems; Project of final detectors; Building of the final detector;
<b>GAMMA ARRAY</b>	<b>J.R.B.Oliveira, P.Finocchiaro</b> <i>C.Agodi, I.Boztosun, L.Campajola, F.Cappuzzello, H. Dapo, P. Finocchiaro, E.M.Gandolfo, J. Isaak, Y. Kucuc, R.Linares, N.H.Medina, M.Morales, J.R.B.Oliveira, L. Pellegri, N. Pietralla, S.O.Solakci, V.Werner, A.Yildirim, V.A.B. Zagatto</i>	Choice of the scintillator; Building prototypes; Test of prototypes; Design of the final detector
<b>THEORETICAL MODELS</b>	<b>M.Colonna, E.Santopinto</b> <i>N.Auerbach, J.I.Bellone, R.Bijker, I.Boztosun, S. Burrello, E.N.Cardozo, M.Colonna, G. De Gregorio, D.Gambacurta, A. Gargano, J.L.Ferreira, J.Ferretti, H.Garcia-Tecocoatzi, J.Kotila, Y.Kucuk, A.Lavagno, J.A.Lay, H.Lenske, J.Lubian, E.Santopinto, R.B.B.Santos</i>	Folding of nuclear structure and reaction models; Development of microscopic DCE theory; Extraction of matrix elements from DCE cross sections <sup>c)</sup>
<b>HIGH INTENSITY BEAM MANAGEMENT</b>	<b>A. D. Russo</b> <i>C. Agodi, L.Campajola, D.Carbone, F. Cappuzzello, M.Cavallaro, A.D.Russo</i>	Beam transport line; beam dump <sup>d)</sup>
<b>IT SYSTEM</b>	<b>L.Pandola</b> <i>I.Boztosun, G.A.Brischetto, S.Calabrese, L.Campajola, F. Delaunay, E.M.Gandolfo, M.Morales, J.R.B.Oliveira, L.Pandola, R. Persiani, O.Sgouros, V.Sharma, V.Soukeras, D. Torresi</i>	DAQ; Computation; Simulations; Storage; Web management
<b>TARGETS</b>	<b>F. Pinna</b> <i>L.Acosta, C.Agodi, L.H.Avanzi, D.Calvo, V.Capirossi, F.Cappuzzello, M. Cavallaro, E.Chavez Lomeli, E.F. Chinaglia, K.M.Costa, F.Delaunay, M.Fisichella, S.Gallian, M. Giovannini, M.A.Guazzelli, A.Huerta Hernandez, F.Iazzi, A.Lavagno, D.J.Marin Lambarri, S. H. Masunaga, N.H.Medina, J.R.B.Oliveira, F.Pinna, T.M.Santarelli, R.B.B.Santos,</i>	Target system design and production; Radiation damage study; Cooling system design; Study of dissipation; Deposition techniques

	<i>D.Torresi, H.Vargas Hernandez, R. G. Villagrán</i>	
<b>INTEGRATION (transversal sub-project)</b>	<b>D.Calvo</b> <i>C.Agodi, S.Brasolin, M.P.Bussa, D.Calvo, L. Calabretta, D.Carbone, F.Cappuzzello, M.Cavallaro, E.R. Chávez Lomelí, C. De Benedectis, F.Dumitrache, C.Ferraresi, A. Huerta Hernandez, P.Mereu, J.R.B.Oliveira, R. Panero, H.Petrascu, D.Sartirana, H. Vargas Hernandez, R. G. Villagrán</i>	Mechanical integration of devices; Design and construction of vacuum chambers;
<b>ELECTRONICS (transversal sub-project)</b>	<b>F. Delaunay, P.Finocchiaro</b> <i>F. Delaunay, P. Finocchiaro, M.A.Guazzelli, N.H.Medina, M.Morales, J.R.B.Oliveira, L.Pandola, R. Persiani, V. Sharma, R.B.B.Santos, V. Soukeras, D.Torresi</i>	Front-end electronics; Readout electronics; Data acquisition

- a) Collaboration with A. Foti
- b) Collaboration with M. Cortesi (MSU).
- c) Collaboration with R.I.M. Vsevolodovna
- d) Collaboration with L. Calabretta

### Technical Board (TB)

COMPONENTS	FORESEEN ACTIVITY
<b>F.Cappuzzello, C.Agodi</b>  <i>C.Agodi, D.Calvo, F.Cappuzzello, D.Carbone, M.Cavallaro, M.Colonna, P.Finocchiaro, R.Linares, J.R.B.Oliveira, L.Pandola, F. Pinna, E.Santopinto, A. D. Russo, D.Torresi, S.Tudisco</i>	Sub-projects coordination activities; Publications management; Conferences management

### Publication Committee (PC)

<b>COMPONENTS</b>	<b>FORESEEN ACTIVITY</b>
<i>D. Calvo, D. Carbone, E. Santopinto, S. Tudisco</i>	Publications management

### Speaker Committee (SC)

<b>COMPONENTS</b>	<b>FORESEEN ACTIVITY</b>
<i>M. Cavallaro, M. Colonna, J.R.B. Oliveira, L. Pandola</i>	Conferences management

### Project management Committee (PM)

<b>COMPONENTS</b>	<b>FORESEEN ACTIVITY</b>
<i>C. Agodi, D. Calvo, F. Cappuzzello, M. Cavallaro, P. Finocchiaro</i>	Risk assessment strategies, time schedule optimization, project control, communication