

NTNP TC

1st Collaboration Mtg

June 1-2, 2023 @ UW/INT

Saori Pastore for the NTNP EC

Funding acknowledgment

This effort is supported by the Department of Energy, Office of Science

Office of Nuclear Physics and Office of High Energy Physics



Objectives

Provide a coherent and robust set of predictions for neutron and nuclear beta decays; neutron and nuclear EDMs; and lepton-nucleus scattering, and facilitate collaborations across sub-fields in NP & HEP to

- maximize the impact of DOE investments in neutron physics and nuclear beta decay;
- provide the theoretical underpinning for the fundamental symmetries portfolio at the Facility for Rare Isotope Beams;
- produce the theoretical input, validated by data from Jefferson Lab, needed for the success of the Deep Underground Neutrino Experiment.

Kickoff mtg with the DOE funding agencies

The [kickoff mtg](#) with the funding agencies was held remotely on Feb 3rd, 2023.

We were *explicitly* asked to elaborate on existing strategies:

1. Aimed at **emphasizing the collaborative nature of this effort**
2. On **workforce development and DEI initiatives**

Scope(s) of this meeting

Broadly speaking, the TC is formed by co-PIs with expertise in: LQCD, EFTs, and Nuclear Structure, collaborating on three main scientific topics, *i.e.*, Precision beta decay, EDMs, and Lepton-nucleus scattering

During this meeting we will:

- Devise strategies to facilitate the *collaboration across the TC sub-fields*
- Work out initiatives in *Workforce development and DEI efforts*
- Others, e.g.:
 - Agree on timeline/location for in person and remote meetings
 - Agree to provide timely inputs for the TC annual reports
 - Gauge the TC members' interest in participating to the Workforce development efforts
 - ... Add your inputs to this [google doc](#)

Mtg's Agenda

Day 1

- Welcome (Vincenzo)
- Intro (Saori)
- Bridge Faculties
 - @ CMU (Colin)
 - @ ODU (Rocco)
- Website (André)
- Coordinators' presentations
 - LQCD (André)
 - EFT (Emanuele)
 - Nuclear Structure (Heiko)
- Discussion
- NTNP Colloquium by Michael Ramsey-Musolf (2023 Feshbach Prize Recipient)

Day 2

- Scientific Thrusts
 - Precision beta decay (Chien-Yeah)
 - EDMs (Jon)
 - Lepton-Nucleus scattering (Noemi)
- Workforce development
 - Summer schools, DEI efforts, ...
 - Students and PDs inputs

Participating PIs and Institutions

25 senior co-PIs; 11 Universities, 6 Laboratories, 1 INT

Vincenzo Cirigliano (**INT/UW**);
Wick Haxton, Andrea Shindler, André Walker-Loud (**LBNL/UC Berkeley**);
Scott Bogner, Heiko Hergert (**MSU**);
Joseph Carlson, Stefano Gandolfi, Emanuele Mereghetti, Ingo Tews (**LANL**);
Bhupal Dev, Saori Pastore, Maria Piarulli (**WashU**);
Jonathan Engel, Amy Nicholson (**UNC**);
Gaute Hagen (**ORNL**);
Alessandro Lovato, Robert Wiringa (**ANL**);
Ragnar Stroberg (**Notre Dame**);
Colin Morningstar (**CMU**);
Thomas Papenbrock, Lucas Platter (**UT**);
Michael Ramsey-Musolf (**UMass/Shanghai Jiao Tong University**);
Noemi Rocco (**FNAL**);
Rocco Schiavilla(**ODU/JLab**)



TC Web Page

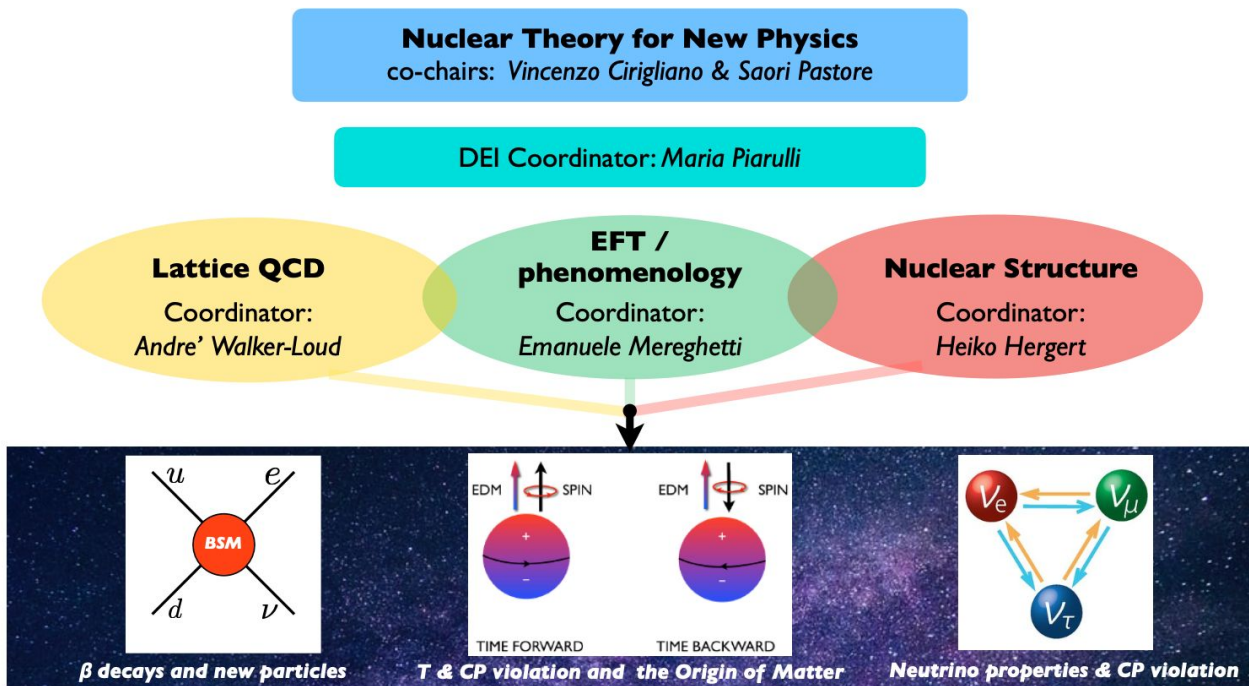
We have a webpage

<https://a51.lbl.gov/~ntnp/TC/>

Meetings, Info, Slides, Papers, Presentations, ... will be posted on the webpage
(more by André)

Do we need a slack channel?

Structure of the TC: executive committee



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Vincenzo is the PI of the TC.

Vincenzo is in communication with the funding agency representatives and manages the grant in collaboration with the UW grant administrators.

Vincenzo and/or Saori call the EC meeting to discuss any aspect related to the TC, to ensure we are making progress on the scientific goals.

EC will report to the Collaboration for further inputs/discussions.

The Executive Team will integrate the different collaboration activities, ensure that collaboration stays on track with the stated goals, and make decisions on budgetary matters.

Structure of the TC

Coordinators by expertises:

André Walker-Loud, Emanuele Mereghetti, Heiko Hergert

- LQCD (André)
- EFT (Emanuele)
- Nuclear structure (Heiko)

Description:

TCs are collaborative efforts.

The coordinators will ensure that the collaborative nature of the TC is observed. They will also make sure that the shared projects are moving forward to meet the goals.

Discussion 1: Logistic/Organization

Some ideas to be discussed related to “how to ensure that the effort is collaborative”

- Short progress report meetings as needed (e.g., ~2 hrs zoom meetings)?
 - Talks should be informative to non-experts to develop a shared language among practitioners of the various expertises
- Shall we set a calendar of activities ahead of time?
 - Agree on timeline/location for in person and remote meetings
 - ...
- Agree to provide timely inputs for the TC annual reports
- Others

DEI Coordinator

DEI coordinator:

Maria Piarulli

Description:

The DEI coordinator will coordinate and implement DEI strategies within the TC with the prime goal of fostering a welcoming and inclusive environment for all the members of the collaboration.

DEI existing initiatives

The DEI Coordinator & the EC implemented the following DEI initiatives:

- We have [DEI statement](#)
- We have a [CoC](#) based on the APS CoC for meetings
- We ask for a DEI statement as part of the application for Bridge Faculty positions supported by the TC
- Underrepresented groups in physics will be actively recruited in searches for positions supported by the TC

Discussion 2: Workforce development and DEI efforts

During our kick-off meeting with the funding agencies, we were encouraged to organize summer schools via the **DOE NUCLEAR PHYSICS – REACHING A NEW ENERGY SCIENCES WORKFORCE (NP-RENEW)** initiative

Some ideas to be discussed related to “what we can do to participate in the NP & HEP workforce development and DEI efforts”

- Organize summer schools and produce lecture notes?
 - How long/when?
 - Which institutions are interested in participating in this effort?
 - Who should the schools be targeted to (UG, GS, PD)?
 - Existing initiatives? E.g., FRIB summer schools and programs?
- Organize summer research experiences for UG?
- Travel awards, fellowships and other forms of awards for underrepresented groups in physics?
- What can we offer more as a TC than single PIs invested in DEI efforts? (e.g., exchange students' programs, shared pipelines of students, ...)
- Inputs from GSs and PDs are extremely valuable and encouraged for this discussion

Discussion DAY 2

What does the TC support: Personnel

- Funds for GSs and PDs
- Funds for 2 bridge positions
- Funds to support travel expenses for the Collaboration Mtgs

Note that, the funds to the universities have not been allocated yet

More details by Vincenzo

Institution	Institution PI	Year 1 Budget	Year 2 Budget	Year 3 Budget	Year 4 Budget	Year 5 Budget	Total Budget
UW	V. Cirigliano	82 (T+IN)	40 (T+IN)	40 (T+IN)	78 (T+GS)	77 (T+GS)	317
CMU	C. Morningstar	0	0	100 (BP)	110 (BP)	120 (BP)	330
ODU	R. Schiavilla	0	103 (BP)	103 (BP)	103 (BP)	0	309
MSU	H. Hergert	80 (PD)	80 (PD)	0	0	0	160
UCB	A. Walker-Loud	120 (PD)	100 (PD)	0	0	0	220
UMass	M. J. Ramsey-Musolf	80 (PD)	50 (PD)	0	0	0	130
UNC	J. Engel	65 (GS)	65 (GS)	0	0	0	130
UTK	L. Platter	0	40 (GS)	50 (GS)	55 (GS)	0	145
WashU	S. Pastore	0	0	48 (PD)	68 (PD)	88 (PD)	204
		427	478	341	414	285	1,945
ANL*	A. Lovato	0	0	60 (PD)	70 (PD)	85 (PD)	215
LANL	E. Mereghetti	75 (PD)	50 (PD)	115 (PD)	0	0	240
ORNL	G. Hagen	0	0	0	0	60 (PD)	60
		502	528	516	484	430	2,460

Table 1: Budget request (\$ in thousands) by institution with institutional lead PI.

Legend: **BP**: Bridge Position; **PD**: Postdoc; **GS**: Graduate Student; **T**: Travel (\$8k per year); **IN**: Indirect (subcontracts).

* Ragnar Stroberg moved from ANL to Notre Dame (ND). ANL will subcontract funds to ND.

What does the TC support: Collaboration Meetings

- Funds (8k) to partially support one in person TC meeting per year to be hosted by
 - ACFI UMass Amherst
 - FRIB/MSU
 - INT/UW (June 2023)
 - UC Berkeley
 - WashU
 - Others

What are our deliverables and timeline

Provide a coherent and robust set of predictions for neutron and nuclear beta decays, neutron and nuclear EDMs, and lepton-nucleus scattering and facilitate collaborations across sub-fields in NP&HEP

Tomorrow we will have talks on the “scientific thrusts”:

- BETA
- EDMs
- XSEC

Activities	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
BETA: β decays					
BETA-1 LQCD calculation of $\Delta_R^A - \Delta_R^V$ and Δ_R^V [VC, EM, AN, AS, AWL]					
BETA-2 EFT for A=2,3 to $O(G_F \alpha)$ [VC, EM, LP, MJRM, RS]					
BETA-3 Calculations of δ_{NS} (CC, HOBET, QMC) [JC, JE, SG, GH, WH, SP, MP, TP, MJRM, RS, IT, RBW]					
BETA-3 Calculations of δ_C (CC, HOBET, IMSRG, QMC) [SB, JC, JE, SG, GH, WH, HH, SP, MP, TP, MJRM, RS, SRS, IT, RBW]					
BETA-4 β decays BSM phenomenology [VC, BD, EM, MJRM]					
EDM Electric dipole moments					
EDM-1 Neutron EDM from q- and g-CEDM [EM, CM, AN, AS, AWL]					
EDM-2 CPV NN potential beyond one-π exchange [VC, EM, LP, MJRM]					
EDM-3 Schiff moments of heavy nuclei [SB, JE, HH, SRS]					
XSEC: Neutrino-nucleus scattering					
XSEC-1 Nucleon elastic form factors with sLapH [CM, AN, AS, AWL]					
XSEC-2 $N \rightarrow \Delta$ transitions with sLapH [CM, AN, AS, AWL]					
XSEC-3 NN e.w. matrix elements with LQCD [CM, AN, AS, AWL]					
XSEC-4 Inclusive processes with QMC, STA, SF [JC, BD, SG, AL, SP, MP, NR, RS, IT]					
XSEC-5 Exclusive processes with STA and SF [JC, SG, AL, SP, MP, NR, RS]					

To DOs as a member of the TC

- Contribute to the realization of the TC scientific objectives
- Participate in the TC activities
- Attend the TC meetings (2 meetings per year, 1 in person, 1 online)
- Acknowledge the DOE fund (**DE-SC0023663**)
- When funds are used, communicate it to the EC
- Participate in the writing of the annual report to be submitted to the funding agencies
- Others

Closing

This effort is supported by the Department of Energy, Office of Science
Office of Nuclear Physics and Office of High Energy Physics

This is the first TC sponsored by both the NP and HEP DOE offices,
it is important to demonstrate that this is a worthwhile endeavor/investment

