

# White paper on “Proton mass”

- Workshop on **Non-perturbative color forces in QCD**  
March 26-28, 2012, Temple Univ (Z.-E.M)
  - 1st Proton Mass workshop, **The Proton Mass: At the heart of most visible matter**  
March 28-29, 2016, Temple Univ (Z.-E. M, J. Qiu)
  - 2nd Proton mass workshop, **The Proton Mass: At the heart of most visible matter**  
April 3-7, 2017, ECT\* (Z.-E.M, B. Pasquini, J. Qiu, M. Vanderhaeghen)
  - **3rd Proton Mass Workshop: Origin and Perspective**  
January 14-16, 2021, ANL (I. Cloët, X. Ji, Z.-E.M, J. Qiu)
  - 4th Proton Mass Workshop, **Origin of the Visible Universe: Unraveling the Proton Mass**  
December 6-10, 2021, INT (I. Cloët, Z.-E.M, B. Pasquini)
- ➔ After 2017 ECT\* workshop organizers got an invitation for a review paper in Rep.Prog.Phys.
- ➔ Idea to turn this into a community white paper
- recent successful example: muon (g-2) white paper  
*arXiv:2006.04822 [hep-ph]* was published in *Phys. Rept. 887, 1-166 (2020)*
  - number of conveners have been contacted, and have agreed to commit themselves

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## ➔ Conveners who have committed as editorial board:

C. Alexandrou, I. Cloët, X. Ji, D. Kharzeev, A. Kronfeld, Z.-E. Mezziani, B. Pasquini, J.-C. Peng, J. Qiu, M. Vanderhaeghen

## ➔ Draft outline:

- 1) Introduction
- 2) Connections to other fields
- 3) Hadrons mass decompositions
- 4) Lattice calculations
- 5) Model calculations
- 6) Observables and measurements

## ➔ **Everyone is invited to contribute and author this white paper**

## ➔ Practical matters:

- Following this workshop, organizers will send an e-mail to all participants with more details
- Everyone can express interest by sending a write-up (in Latex) of up to 1-page to Ian Cloët ([icloet@anl.gov](mailto:icloet@anl.gov)) by the end of January 2021.
- Conveners will make an initial organization/outline of the material and make it available to the contributors
- Aim to have first draft by summer 2021