// What can we / want to do with the Competence Center ?

- The goal is to have a transversal organization, in order to explore synergies
  - groups and scientific/computing infrastructures have the dedicated resources and teams → the competence center aims at fostering our know-how in dedicated areas, keeping in mind possible applications and services
  - The proposal is to have a rather informal organization → we want to be effective and flexible
  - **Short term goals**: foster our expertise in the field of Big Data (and Data Sciences in general); build a common background and share experience; identify common projects and services we could provide to the community (LIP and beyond)
  - **Medium term goals**: build a training program (internal and external to LIP); have dedicated teams engaged in different projects (synergies are expected)
  - **Longer term goals**: *we should discuss where we want to go…*; personally I think we can aim at being a reference in this field, providing services to the academic and industrial communities in Portugal

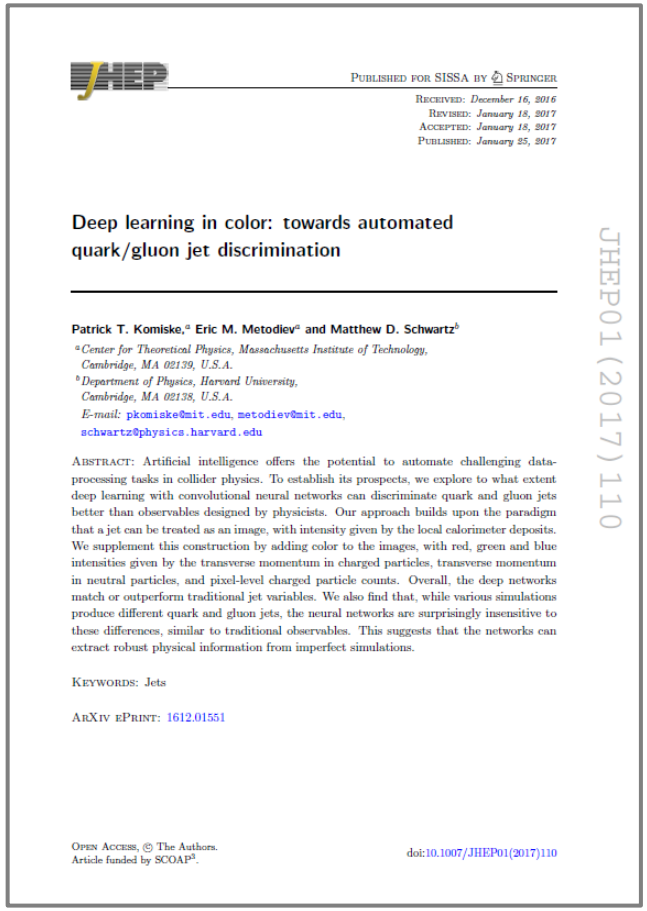
// What can we / want to do with the Competence Center ?

- Areas of interest
  - *This is something we should discuss today!* I think we have two obvious lines to explore:
    - Efficient processing of large datasets
    - Advanced Machine Learning techniques (in HEP and beyond)
  - We should keep in mind that this is a very active field and we don't want to reinvent the wheel → profit from the available tools (we do want to be efficient in adapting and expanding them to our needs)
- In order to have a regular forum for exchange of ideas and discussion I propose to have vidyo meetings on a ~monthly basis: *Friday 10am*
  - Tentative dates for 2017: 14th July; 15th September; 20th October; 17th November; 15th December

// Journal Club

- Proposal of a regular *Journal Club* during our meetings: each time a volunteer will present and motivate the discussion of a relevant paper or project (relevant for our activities). It doesn't have to be his/her own work: the goal is to motivate an interesting discussion

  - Today we start with Guilherme
  - Volunteers for next sessions?
    (please contact me)



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Deep learning in color: towards automated quark/gluon jet discrimination

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Abstract: Artificial intelligence offers the potential to automate challenging data-processing tasks in collider physics. To establish its prospects, we explore to what extent deep learning with convolutional neural networks can discriminate quark and gluon jets better than observables designed by physicists. Our approach builds upon the paradigm that a jet can be treated as an image, with intensity given by the local calorimeter deposits. We supplement this construction by adding color to the images, with red, green and blue intensities given by the transverse momentum in charged particles, transverse momentum in neutral particles, and pixel-level charged particle counts. Overall, the deep networks match or outperform traditional jet variables. We also find that, while various simulations produce different quark and gluon jets, the neural networks are surprisingly insensitive to these differences, similar to traditional observables. This suggests that the networks can extract robust physical information from imperfect simulations.

Keywords: Jets

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