US Workshop on IC Design for High Energy Physics – HEPIC2013

White Paper Status Report

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Office of Science

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Motivation:
Community Summer Study (CSS) 2013 Minnesota 7/29 to 8/6 (Snowmass on the Mississippi)

- The American Physical Society's Division of Particles and Fields (APS-DPF) is pursuing a long-term planning exercise for the high-energy physics community.
  - Goal is to develop the community's long-term physics aspirations.
  - Narrative will communicate the opportunities for discovery in high-energy physics to the broader scientific community and to the government.
- Study groups
  - Energy Frontier
  - Intensity Frontier
  - Cosmic Frontier
  - Instrumentation Frontier
  - Computing Frontier

Motivation con't

- Instrumentation Frontier group works closely with the DPF appointed Coordinating Panel for Advanced Detectors (CPAD)
  - Identify the strengths and weaknesses of the US Detector R&D program
  - Identify existing technologies in which future R&D will help enable this physics and/or make it more affordable
  - Identify potential transformative technologies
  - Identify technologies in commercial use or being used in other scientific fields which have the potential to have deep impact in capability and cost to existing and future physics programs, and
  - Identify non-promising branches of R&D

CPAD

- Technology categories
  - Sensors
  - Gaseous Detectors
  - Detector Systems
  - Electronics, Trigger, and Data Acquisition
  - Software
  - Emerging Technologies
- Summary white paper for “Electronics, Trigger, and Data Acquisition” in progress (editor: G. Haller)
  - Part of that is white-paper on ASICs: “Strategy for Integrated Circuit Design in US High Energy Physics”
  - First draft was distributed to work-shop attendees

Scope

- The scope of the whitepaper includes the following topics:
  - Needs for IC technologies to enable future experiments in the three HEP frontiers – Energy, Cosmic and Intensity Frontiers
  - Challenges in the different technology and circuit design areas and the related R&D needs
  - Motivation for using different fabrication technologies
  - Outlook of future technologies including 2.5D and 3D
  - Survey of IC's used in current experiments and IC's targeted for approved or proposed experiments.
  - US role in IC design and how the US design efforts might be organized in the future especially pertaining to international collaborations

Request

- Looking for input to whitepaper
  - Presentations & discussions at this workshop
  - Additions/deletions/modifications to whitepaper
    - Anything wrong in the paper?
    - Anything missing?
    - Anything not needed in the paper which is currently covered?
    - Any of the opinions/conclusions need modification?
    - Technical as well as strategy
  - Focus on what is needed in ASIC development to improve science and/or make possible future experiments
  - Comments to Gunther Haller, haller@slac.stanford.edu

Content

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Schedule

- May 30 – June 1, 2013: HEPIC workshop
- June 7: Last date to receive attendees comments
- June 10: Incorporate modifications from workshop discussions, comments from attendees
- June 14: Circulate final draft
- June 30: Final white paper due to CPAD

- Please email comments to editor Gunther Haller, haller@slac.stanford.edu