TSS17-2017-000022

Abstract for an Invited Paper
for the TSS17 Meeting of
the American Physical Society

Who Needs Computation in Undergraduate Physics Courses?

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In recent years computation has significantly shaped science and engineering practices. Research and development in the professional sciences and engineering have adopted this "three legged" (theory, experiment, and computation) approach at "warp speed" amid breath taking achievements. But with few exceptions, computation has not yet been integrated with theory and experiment across undergraduate curricula. This suggests that the transition process is either very difficult or not a high priority. Physics faculty have traditionally been responsible for designing the physics curriculum in this country. The AAPT SPINUP study found that undergraduate curricula – standard offerings, topics, and their arrangement in the courses – are highly standardized among American colleges and universities, despite an absence of external standards. This implies that agreement on content among undergraduate physics instructors is quite uniform, even if their pedagogy is not. Faculty are the key to breaching this uniformity. This talk describes a path for transition based upon survey findings of the *American Institute of Physics* (AIP). That study stimulated the *Partnership for Integration of Computation into Undergraduate Physics* (PICUP) to develop a Framework for faculty development learning to use computation in their courses. Now, with the support of the NSF and the AAPT, PICUP projects are underway to carry out this work in supportive and collaborative environments. Faculty and students need this.