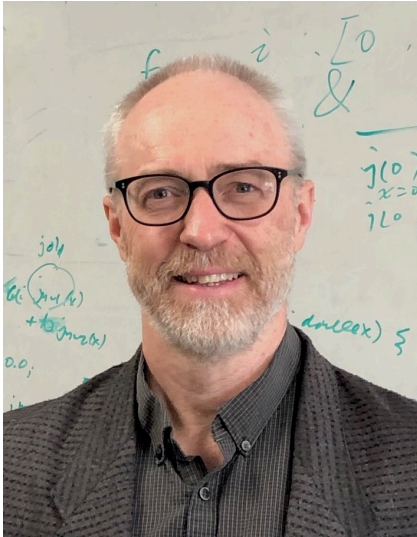


Discovering Hybrid Mesons



Speaker: Eric Swanson

Host: Yunyun Fan

Time: 12 June, 10:30

Location: Main Building A419

Indico: <https://indico.ihep.ac.cn/event/29870>

Zoom: <https://zoom.us/j/99876774561?pwd=HeVtHH9mVQsr8NXK78uVObxOiDFDqM.1>

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Abstract:

In the absence of clear signals of new particles at the energy frontier, precision Recent developments in the theory and phenomenology of QCD exotic hybrid mesons will be reviewed, focussing on prospects for finding such states at COMPASS, GlueX, and BESIII. This is followed by an examination of methods to extend traditional methods of fitting data, which involve hypothesis testing, with "discovery" declared if the null hypothesis is rejected. This approach often assumes that the data is generated by the model, under-estimates systematic errors, and leads to overfitting. Common methods for overcoming the last issue, such as LASSO, AIC, and BIC do not perform well. In addition, the entire methodology relies on the dubious prospect of finding the global minimum of a complex multidimensional objective function. I propose to address these issues by reframing discovery as "predictiveness" -- namely does a postulated effect (eg, a new particle) assist in predicting new measurements. The method obviates many of the traditional problems and leads to more robust results. The implementation of the scheme and applications to simple problems will be presented.

About the speaker:

Eric Swanson is a professor of physics at the University of Pittsburgh, with previous positions at North Carolina State University and the Massachusetts Institute of Technology. He was a visiting student at Oxford University before obtaining his PhD from the University of Toronto in 1991. He has published more than 100 papers on theoretical hadronic physics, condensed matter physics, biophysics, and science communication. Swanson was named an American Physical Society Fellow for his work on exotic particles and is a founder of the Topical Group on Hadronic Physics of the APS. He is the author of "Science and Society", "Applied Computational Physics", and numerous op-eds on science issues. He is currently a consultant for the telecoms group CTIA and a spokesperson for the DOE ExoHad Topical Collaboration.