

HỘI THẢO

“Những vấn đề vật lý lý thuyết hiện nay”

Địa điểm: P 315, Viện Vật lý, số 10 phố Đào Tấn, Hà Nội  
Thời gian: 9h-16h30, thứ Ba, ngày 27 tháng 5 năm 2025

Thời gian	Tiêu đề và người báo cáo	Tóm tắt báo cáo
9:00-9:30	Đón tiếp đại biểu và đăng ký	
9:30-10:15	Extended 2HDM theory with low scale seesaw mechanisms  PGS. TS. Đỗ Thị Hương	We have developed an extension of the inert doublet model in which CP-phases in the weak sector are generated from one-loop level corrections mediated by dark fields, while the strong-CP phase arises at three-loop. In this framework, tiny masses of the active neutrinos are produced through a radiative inverse seesaw mechanism at a two-loop level, the masses of the first and second families of SM-charged fermions arise from a one-loop level radiative seesaw mechanism, and the third generation of SM charged fermion masses are generated at tree level. We have demonstrated that the proposed model successfully accounts for SM fermion masses and mixings. The radiative nature of the seesaw mechanisms is attributed to preserved discrete symmetries, which are required for ensuring the stability of fermionic and scalar dark matter candidates. The preserved discrete symmetries also allow for multi-component dark matter, whose annihilation processes allow successful reproduction of the measured amount of dark matter relic abundance for an appropriate region of parameter space, which has shown to be compatible with current dark matter direct detection limits. Besides that, we explore the model’s ability to explain the 95 GeV diphoton excess observed by the CMS collaboration, showing that it readily accommodates this anomaly. We have shown that charged lepton flavor violating decays acquire rates within the current experimental sensitivity.

Thời gian	Tiêu đề và người báo cáo	Tóm tắt báo cáo
10:15-11:00	<p>Mu2e conversion in a model of mirror symmetry.</p> <p>TS. Đinh Nguyên Dinh</p>	<p>We perform a detailed analysis of the <math>\mu\text{-}e</math> conversion within an extended version of the standard model (SM) with mirror symmetry and low energy of the electroweak scale of the type I seesaw neutrino mass generation. After a brief introduction to the model, we derive the <math>\mu\text{-}e</math> conversing ratio at one-loop approximation, in which the running inside are W gauge boson or singly charged scalars accompanying with neutrinos, and neutral scalars with new leptons. We focus, mainly, on predictions of observable possibilities and constraints set on relevant couplings from the <math>\mu\text{-}e</math> conversion in nuclei.</p>
11:00-11:45	<p>Can we have a second light Higgs boson in the U(1) model ?</p> <p>TS. Nguyễn Tuấn Duy</p>	<p>Our theoretical model predicts the existence of a light-mass CP-even Higgs boson (<math>\mathcal{H}_1</math>) and a light-mass pseudo-scalar boson (<math>\mathcal{A}</math>). The mass ranges for these particles are determined by the cubic coupling, <math>\mu_4</math>, at the electroweak energy scale. These light Higgs bosons can produce flavor-changing neutral currents, which play a significant role in meson mixing processes. Specifically, when <math>m_{\mathcal{A}} = s \alpha m_{\mathcal{H}_1}</math>, the contributions to flavor mixing can either completely cancel each other out or, conversely, become extremely large.</p>
11:45-14:00	Nghỉ trưa	
14:00-14:45	<p>Nghịch lý con mèo của Schrodinger và một số cách giải thích cơ học lượng tử</p> <p>PGS.TS. Hoàng Anh Tuấn</p>	<p>Cùng với nghịch lý EPR của Einstein - Podsky - Rosen, Con mèo của Schrodinger là một nghịch lý nổi tiếng khác trong cơ học lượng tử. Nhân kỷ niệm 100 năm ra đời của cơ học lượng tử và 90 năm xuất hiện nghịch lý Con mèo của Schrodinger, trong báo cáo này chúng tôi giới thiệu những vấn đề mà thí nghiệm tư duy này đã đặt ra nhưng cho đến nay vẫn chưa được giải quyết thấu đáo, cũng như một số cách giải thích</p>

Thời gian	Tiêu đề và người báo cáo	Tóm tắt báo cáo
		về cơ học lượng tử như cách giải thích chính thống Copenhagen, diễn giải đa thể giới, cơ học Bohm và lý thuyết sụp đổ khách quan.
14:45-15:30	Two dimensional crystalline carbon nitrides.  PGS.TS Trần Minh Tiến	A review of two dimensional crystalline carbon nitrides is presented. The two dimensional crystalline carbon nitrides have the graphene-like atom structures with semiconductor nature. A model for them is proposed. The model is based on the tight binding model with local Coulomb interaction on the honeycomb lattice with defects. Using the two-parameter tight binding method, the electronic and magnetic structure are revealed.
15:30-16:15	Altermagnetism: insights from theory and experiment  TS. Nguyễn Thị Hải Yến	Altermagnetism represents a newly discovered magnetic phase that bridges the gap between conventional collinear antiferromagnetism and ferromagnetism. Unlike traditional antiferromagnets, altermagnets exhibit spin-split electronic bands despite having zero net magnetization, owing to their unique symmetry properties. This novel class of materials combines the advantages of antiferromagnets—such as robustness against external magnetic fields and ultrafast spin dynamics—with the spin-polarized band structures typically found in ferromagnets. As a result, altermagnets open up promising avenues for spintronics applications, enabling efficient charge-to-spin conversion without the drawbacks associated with magnetic stray fields. Recent theoretical and experimental advances have identified candidate materials and confirmed their altermagnetic characteristics, marking an important step toward practical implementation in next-generation spin-based devices.
16:15-16:30	Tổng kết hội thảo	