A SYMPOSIUM IN HONOR OF TAO HAN

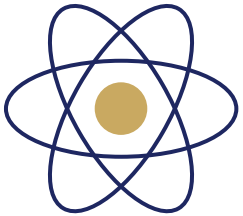
The Madison–Pitt Legacy

From Theoretical Beauty to Collider Discovery

MAY 14–15, 2026

University of Pittsburgh

Note the terrace chairs →



Tao Han

PhD, UW–Madison · 1990

*Bridging theory and experiment in the **Golden Era of Phenomenology***

Phenomenologist · Mentor · Builder of communities

WITH US TODAY

UW Phenolanders & Alumni

Here to celebrate Tao's amazing career — and its lasting impact on particle physics and on mentoring the next pheno generations.

UW–MADISON

- **Lisa Everett**
- **Francis Halzen**
- **Dan Hooper**

UW PHENO ALUMNI & FORMER UW FACULTY

- **Neil Christensen** · *Illinois State University*
- **Hooman Davoudiasl** · *Brookhaven National Laboratory*
- **Kaoru Hagiwara** · *KEK*
- **Ian Lewis** · *University of Kansas*
- **Zhen Liu** · *University of Minnesota*
- **Tilman Plehn** · *Heidelberg University*
- **Xerxes Tata** · *University of Hawai'i at Mānoa*
- **Liantao Wang** · *University of Chicago*
- **Dieter Zeppenfeld** · *KIT, Karlsruhe*

Tao's PhD Years at UW–Madison

The Spirit of Chamberlin Hall

During this time, the Madison "Pheno" group was exceptionally cohesive. These individuals were either fellow students or postdocs with whom Tao co-authored several foundational collider papers.

THE PHD-ERA CIRCLE

Collaborator	Madison Role	Scientific Synergy
James Ohnemus	PhD student	NLO heavy-quark & triple-gauge-boson production
Kingman Cheung	PhD student	Strong WW scattering & Higgs collider signatures
Howard Baer	PhD student	Early top quark physics
Scott Willenbrock	Postdoc	Structure-function approach to VBF discovery
Kaoru Hagiwara	Postdoc	Higgs signals & electroweak-precision isolation

Tao's PhD-Era Publications

Three foundational papers that defined his trajectory — the collider phenomenology papers set the stage for the LHC No-Lose Theorem that followed.

1989

Some New Aspects of R-Parity-Violating SUSY

Barger, Giudice & Han · Phys. Rev. D40, 2987

Systematic phenomenology of R-parity violation — a framework that shaped SUSY collider analyses for decades.

1990

Strong W^+W^+ Scattering Signals at pp Supercollider

Barger, Cheung, Han & Phillips · Phys. Rev. D42, 3052

Established the collider signature of strong electroweak symmetry breaking — the no-Higgs leg of the No-Lose argument.

1991

Intermediate Mass Higgs Boson Physics at Hadron Colliders

Barger, Bhattacharya, Han & Kniehl · Phys. Rev. D43, 779

Mapped the search for the standard-model Higgs in the elusive intermediate-mass window via H → W*W* → leptons + missing energy.

A LANDMARK

The 1994–95 No-Lose Theorem

> ***"The LHC will discover the mechanism of electroweak symmetry breaking."***

Guaranteed Discovery of the Higgs or New Physics at multi-TeV energies

AUTHORSHIP

Bagger et al., 1994/95

The landmark study, with Tao Han playing a leading role.

RESULT

A guarantee, not a hope

Proved the LHC would either find the Higgs or the strong WW dynamics.

IMPACT

The mandate to build

Provided the strategic case that justified construction of the LHC.

Tao's Higgs Search Toolkit

Three signature contributions that defined the LHC Higgs-search playbook — applied and refined throughout his Madison return, which contributed to the Higgs discovery by ATLAS and CMS.

1991

Cluster Transverse Mass

A new variable for reconstructing Higgs decays with missing energy — a foundational technique for isolating signals from massive backgrounds.

1991

Forward-Jet Tagging & Central-Jet Vetoing

Initiated the strategy that became the standard for Higgs discovery via Vector Boson Fusion.

1992

Structure-Function Approach to EWSB

Pioneering NLO framework for vector-boson scattering — figures from this work appear in the iconic Collider Physics textbook.

PhD Alumni — The Madison Generation

From a single advisor, a generation of leaders dispersed across continents.

Alumnus	PhD Year	Current Position
Danny Marfatia	2001	Professor, University of Hawaii
Piyabut Burikham	2005	Professor, Chulalongkorn University
Kai Wang	2008	Professor, Zhejiang University
Tong Li	2008	Associate Professor, Nankai University
Ian Lewis	2011	Professor, University of Kansas

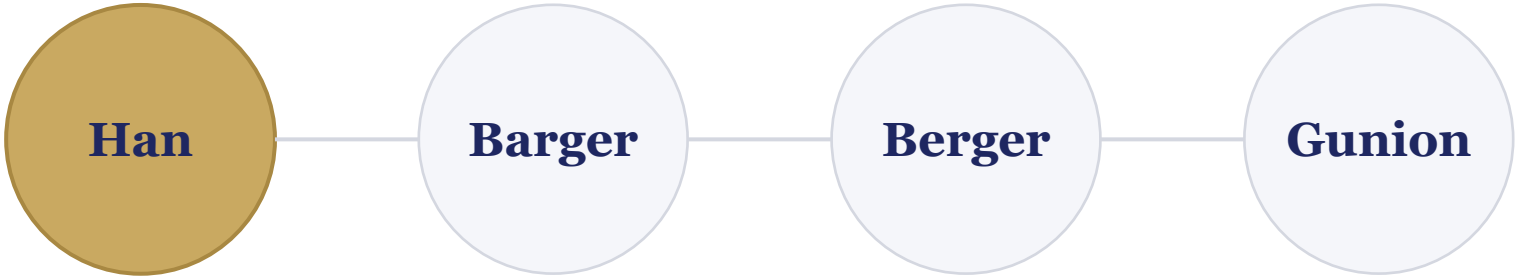
SELECTED WORK WITH MADISON POSTDOCS: ***Phenomenology of the Little Higgs Model*** (Han, Logan, McElrath & L.-T. Wang, 2003) · Phys. Rev. D67, 095004.

LOOKING FORWARD

The Muon Quartet

Founding paper: *Barger, Berger, Gunion & Han,* ***s-channel Higgs Boson Production at a Muon-Muon Collider****,* Phys. Rev. Lett. 75, 1462 (1995).

Tao's vision for the next frontier — co-founder of the team defining the physics potential of a multi-TeV muon collider.



Tao harmonizing theory with the next multi-TeV frontier. **A top priority for P5 and the NAS.**

SELECTED PAPER

Han, Liu, L.-T. Wang & X. Wang, ***WIMPs at High-Energy Muon Colliders****,* Phys. Rev. D103 (2021).

FOLLOW-ON COMMUNITY VISION

Al Ali, Arkani-Hamed, et al., ***The Muon Smasher's Guide****,* Rep. Prog. Phys. 85 (2022).

The Search for Heavy Majorana Neutrinos

Tao's foundational contributions to lepton-number violation at hadron colliders — defining the search strategy and the community reference for a generation of LHC analyses.

2006

Signatures for Majorana Neutrinos at Hadron Colliders

Han & Zhang · Phys. Rev. Lett. 97, 171804

Introduced the same-sign dilepton + jets channel as the landmark LHC signature for heavy Majorana neutrinos via the Type-I Seesaw mechanism.

2008

Neutrino Masses and the CERN LHC: Testing Type II Seesaw

Fileviez Perez, Han, Huang, Li & Wang · Phys. Rev. D78, 015018

Extended the programme to the Type-II Seesaw — doubly-charged Higgs triplets and multi-lepton signatures at the LHC.

2009

The Search for Heavy Majorana Neutrinos

Atre, Han, Pascoli & Zhang · JHEP 0905:030

The definitive community review of heavy neutral lepton searches — a 1,000+ citation reference that shaped the LHC experimental programme.

RECOGNITION

2025 APS Mentoring Award

Meenakshi Narain Award · Division of Particles and Fields

> *Outstanding mentoring, sustained and caring early-career advising, and a quarter century cultivating the welcoming and supportive Phenomenology symposium.*

— American Physical Society, Division of Particles and Fields

Four decades · Two universities · A global community of students.

ALSO RECENT

Honors

A career's breadth of recognition.

2024

Alexander von Humboldt Research Award

Federal Republic of Germany

2025

Distinguished Alumni Award

UW–Madison Department of Physics

Building the Community

Sustained leadership in the American Physical Society and the U.S. particle physics planning process.

2019–2022

APS Division of Particles and Fields

Vice-Chair (2019) · Chair-Elect (2020) · Chair (2021) · Past-Chair (2022)

Led the largest division of the American Physical Society through the COVID era — stewarding the field's strategic priorities.

2020

APS April Meeting

Chair

Organized the APS Division's flagship annual gathering.

2020–2022

Snowmass 2021 — Particle Physics Community Planning Exercise

Chair-line and Steering Committee

Helped guide the once-per-decade community process that sets U.S. particle-physics priorities for the coming decade.

1998–present

Phenomenology Symposium Series

Founding & continuing organizer · UW–Madison and University of Pittsburgh

Built and sustained the field's premier annual gathering for collider phenomenology — a quarter-century legacy of community-building cited in the 2025 APS Mentoring Award.

UNIVERSITY OF PITTSBURGH · 2011–PRESENT

PITT PACC

Headquarters of Discovery

Since 2011, at Pitt, Tao has led us in new paths of phenomenology research that will be exciting topics of other speakers at this meeting.

With gratitude

For the theorems and the phenomenology.
For the meetings you built and the students you raised.
For the warmth, the rigor, and the example.
And above all, your friendship.

Here's to the next chapter.