Curriculum Vitae

Harvey Tian · 田世豪

Founder & Editor-in-Chief, Tian2 Editions (田二) — STEM research mentor, competition coach, and science-competition judge. Computational plasma physicist by training.

tianshihaopsss@163.com · tian-2.com

SUMMARY

Editor and founder behind Tian2 (田二), a warm editorial education publisher. I coach high-school students through the world's most demanding science competitions and research programs — Regeneron ISEF, the Regeneron Science Talent Search, the S.-T. Yau (丘成桐) Science Award, the Thermo Fisher Junior Innovators Challenge, the British Physics Olympiad, the Princeton University Physics Competition, and the major US/UK olympiads — then publish the books, worked solutions, and essays that make hard ideas reachable. My research background is in computational plasma physics (Cornell, Sandia, Argonne). I serve as a Regeneron ISEF Grand Award Judge in Physics & Astronomy, a Conrad Challenge Grand Judge, and a PUPC Problem Creator. The Tian2 catalogue spans 52 competition playbooks, 41 AP study guides, 29 typeset solution volumes, and a 213-page bilingual S.-T. Yau white paper — all set in one editorial system of cream and ink. Bilingual (EN/ZH).

EDUCATION

Ph.D., Electrical & Computer Engineering 2012 — 2019

Cornell University, College of Engineering — Ithaca, New York

B.A., Physics & Computer Science 2008 — 2012

University of Virginia, College of Arts & Sciences — Charlottesville, Virginia

RESEARCH EXPERIENCE

Simulation of Plasma Experiments 2014 — 2019

Cornell University, Plasma Physics Laboratory

Built and ran simulation models of gas-puff **Z-pinch** plasma phenomena using the high-precision radiation-MHD code **PERSEUS**.

Developed and maintained PERSEUS, synthesizing experimental and simulation data into a unified picture.

Collaborated with **Princeton University** and **Imperial College London** on cross-institutional validation.

Dissertation scope: Z-pinch implosion dynamics, radiation-MHD, and spectroscopic comparison with experiments at Cornell's Linear Induction Plasma Accelerator (LIPA).

Saha Ionization Model Correction in Z-pinch Plasma 2016 — 2017

Sandia National Laboratories · within Ph.D.

Investigated the interplay of radiation and ionization in gas-injection Z-pinch using the **Mach2** radiation-MHD code and **ParaView**.

Derived and implemented a compilable correction to the **Saha ionization model**; validated it against the original model and against empirical results.

Novel Method of MgB_2 Fabrication — 2012 — 2014

Cornell University, Accelerator Laboratory · early Ph.D.
Devised a simplified fabrication method for **superconducting MgB_2** accelerator-cavity coatings.
Synthesized small-area MgB_2 samples and verified their superconducting transition.

Simulation of APS X-ray Detector — 2010 — 2011

Argonne National Laboratory, Advanced Photon Source · undergraduate
Simulated electron-detector operation within the **Advanced Photon Source (APS)**.
Measured energy profiles and tuned the simulation against actual detector measurements.

ROLES & POSITIONS

Founder & Editor-in-Chief — Present

Tian2 Editions · 田二 — tian-2.com
Direct the brand, design system, and editorial standard across every product line — competitions, books, AP, and programs; commission, typeset, and publish each volume to one cream-and-ink standard.

STEM Research Mentor & Competition Coach — Present

Tian2 · independent
Guide original student research from first question to finished paper, and prepare students for the hardest STEM contests to the standard that real review and judging demand — ISEF, STS, Yau, JIC, EPQ, and the major olympiads.

Author & Typesetter — Solution Volumes — Present

Physics · Astronomy · Mathematics · Biology
Write and typeset fully worked solution books in LaTeX — original analysis, set like prose across a 29-volume shelf.

TEACHING & MENTORING

JUDGING & PROBLEM AUTHORSHIP

Regeneron ISEF Grand Award Judge — Judge
Physics & Astronomy category — Society for Science / Regeneron ISEF

PUPC Problem Creator — Author
Princeton University Physics Competition

Conrad Challenge Grand Judge — Judge
Conrad Foundation

PROGRAMS MENTORED & COACHED

ISEF	Regeneron International Science & Engineering Fair
STS	Regeneron Science Talent Search
Yau · 丘成桐	S.-T. Yau High School Science Award
JIC	Thermo Fisher Junior Innovators Challenge
EPQ	Pearson Edexcel Extended Project Qualification
MCM / HiMCM	Mathematical Contest in Modeling
IYPT	International Young Physicists' Tournament
PhysicsBowl	AAPT PhysicsBowl
BPhO	British Physics Olympiad
Conrad	Conrad Challenge — innovation & entrepreneurship

MENTORING OUTCOMES — ANONYMIZED ARCHETYPES

Pure mathematics (Yau-level) — Riemann–Liouville fractional integral of Lipschitz functions; manuscript complete; two-paper Yau portfolio with MIT PRIMES alignment.
Materials chemistry (ISEF) — GO–PLA biodegradable composite for water filtration; Langmuir q_m = 197 mg/g; ISEF-level poster and presentation.
Computational plasma physics — discontinuous-Galerkin / Hall-MHD magnetic-reconnection simulation; full thesis and poster to ISEF standard.
Machine learning / astronomy — ML exoplanet detection on Kepler + TESS data (transformer + random forest); competed at LACSEF with ROC / confusion-matrix validation.
Crowd-dynamics simulation — social-force + floor-field pedestrian-evacuation model in bespoke Python; ISEF standard.
Computer vision / segmentation — real-time semantic segmentation for autonomous driving (Cityscapes, >30 fps); CVPR-template paper draft.
Causal machine learning — PC-algorithm causal discovery on CDC BRFSS 2014–23 data for cancer risk; F1 = 0.942; science-fair competed.
Electrocatalysis — electrocatalytic nitrate-to-ammonia (N-reduction); presented at regional and state science fair (2025).
Cancer immunology / epigenetics — FTO m^6A-demethylase targeting in NSCLC; ISEF 2027 and Yau 2026 targets.
Anonymized archetypes; student identities withheld. Named, consented outcomes available on request.

PRODUCTS & EDITORIAL

52
Competition playbooks — The Tian2 Library of Competitions

41
AP subjects — The Tian2 Study Library

29
Typeset solution volumes (LaTeX)

~213pp
Bilingual S.-T. Yau (丘成桐) white paper

3
AI-evaluator suites — STS, JIC, EPQ

THE TIAN2 LIBRARY OF COMPETITIONS — 52 PLAYBOOKS

Each title published in Student, Advisor, and Format editions (HTML / PDF / EPUB). Coverage spans Mathematics (10), Physics (6), Astronomy (1), Biology (4), Chemistry (2), CS & Informatics (6), Economics & Business (8), Essay & Writing (6), Linguistics (2), History (1), Research & Science-Fair (3), and Engineering / Health / Quiz (4). Flagship: the fully QA-validated John Locke Essay Guide.

THE TIAN2 STUDY LIBRARY — 41 AP SUBJECTS

Dual-derivation, SymPy-verified FRQ solutions with clean-room original practice items — 349 pages and 283 unit records across the built static site.

TYPESET SOLUTION VOLUMES — 29-VOLUME LATEX SHELF

F = ma — Complete Solutions 740 pp
US Physics Team prelim · by topic and by year
PhysicsBowl — Detailed, Intermediate & Concise Solutions 689 pp
AAPT PhysicsBowl · three editions
British Physics Olympiad — Round 1 Solutions 456 pp
BPhO · by topic and by year

BAAO Astronomy & Astrophysics — Complete Solutions 347 pp
British Astronomy & Astrophysics Olympiad
Senior & Intermediate Physics Challenge — Solutions 304 pp
BPhO SPC & IPC · by topic and by year
Princeton University Physics Competition (PUPC) 245 pp
Problems & solutions, 2015–2024
AMC 8 / 10 / 12 — Complete Solutions 1,689 pp
2000–2025 · by topic and chronological
AIME — Master Solutions 1,615 pp
American Invitational Mathematics Examination
USAMO — Complete Solutions 413 pp
by topic and chronological
British Biology Olympiad — Annual Solution Volumes 2019–24
2019–2024 · six volumes

WHITE PAPER & AI-EVALUATOR SUITES

S.-T. Yau (丘成桐) High School Science Award White Paper — ~213 pp, bilingual (ZH primary / EN parallel); seven chapters covering award structure, per-subject hot topics and winning-paper analysis, research and paper-writing method, judge-background analysis, 2020–2025 winners data, a self-evaluation framework, and AI-use compliance.
STS AI-Evaluator — Regeneron STS applications; four-criterion rubric (/20) with research cross-reference and AI-content detection.
JIC Evaluator — Thermo Fisher Junior Innovators Challenge; adapted from the STS engine, with a 42-application Physics evaluation conducted.
EPQ Grader — Pearson Edexcel EPQ (AO1–AO4); ML-based auto-scoring with an A/B/C exemplar bank.

SKILLS & TOOLS

RESEARCH & SCIENTIFIC COMPUTING

Plasma simulation — PERSEUS (custom radiation-MHD code), Mach2, ParaView
Superconducting materials — MgB_2 synthesis and characterization
Detector simulation — Geant4-type workflows (Argonne APS context)

PUBLISHING & TYPESETTING

Advanced LaTeX — ElegantBook, CVPR template, BPhO / APS-style solution books
Design-system authorship — cream / ink / coral; Playfair + Inter + Bebas Neue + Noto Serif SC
Static-site generation — Python / Jinja2 pipelines; 349-page sites from JSON

AI & SOFTWARE ENGINEERING

AI-evaluator engineering — rubric scoring, LLM-grading pipelines, OpenRouter / GPT integration
Python — SymPy, pandas, Jinja2, KaTeX rendering
JSON data architecture — canonical catalog schemas, competition registries

EDITORIAL & CURRICULUM

Bilingual editorial direction (EN / ZH)
Curriculum & assessment design — AP, EPQ, olympiad
Competition-playbook authorship — Source → Normalize → Analyse → Publish

AWARDS & SERVICE

Regeneron ISEF Grand Award Judge Judge
Society for Science / Regeneron ISEF — Physics & Astronomy category
Conrad Challenge Grand Judge Judge
Conrad Foundation

PUPC Problem Creator Author

Princeton University Physics Competition

Regeneron STS Evaluator Evaluator

Society for Science — built the AI-scoring engine; ran evaluation on the 2024 Top-400 corpus

JIC Evaluator Evaluator

Thermo Fisher / Society for Science — conducted a 42-application Physics evaluation