RESULTS OF THE CAP-IYQ 2025 "QUANTUM ARTS" AND CAP-IYQ LOGO DESIGN COMPETITIONS / RÉSULTATS DES CONCOURS ACP-IYQ 2025 « QUANTUM ARTS » ET CONCOURS DE DESSIN DE L'ACP-IYQ 2025

By **THE CAP INTERNATIONAL YEAR OF QUANTUM SCIENCE AND TECHNOLOGY TASK FORCE / PAR L'ÉQUIPE DE L'ACP** DE L'ANNÉE INTERNATIONALE DE LA SCIENCE ET DE LA TECHNOLOGIE QUANTIQUES

THE CAP-IYQ 2025 "QUANTUM ARTS" COMPETITION / CONCOURS ACP-IYQ 2025 « QUANTUM ARTS »

As part of the International Year of Quantum Science and Technology celebration, the CAP invited participation in the **CAP-IYQ 2025 "Quantum Arts" Competition**, a Canada-wide showcase of creativity inspired by quantum themes. The competition was open to everyone in Canada, with prizes of up to $500 available in three categories: visual arts, performing arts, and literature. The artwork could be literal or abstract; scientific, humorous, or poetic.

Thirty-four submissions were received from the general call, and we are delighted to announce the winners in each category:

	Literature	Performing Arts	Visual Arts
1st Prize ($500)	Cristian Ramirez Rodriguez *Pauli Matrices with Scaling Factors*	Stefanos Kourtis *Windchime #13*	Julie Bélanger *Quantum Bloom*
2nd Prize ($300)	Abiy Nedie *Superposition*	Graeme Dyck *Quantum Gates*	Sareen Sabra *Schrodinger's Stereogram*
3rd Prize ($200)			Elham Zohari *Untitled Diamond*
Honourable Mentions	Richard Germain *Oh Quanta!*		Ruvé Staneke *Untitled Butterflies* Amelia Alcock-White *Entanglement* Hansima Keppetiyawa *Untitled SEM*

The main results are reproduced in this article; please see the [IYQ website](#) for further details.

PAULI MATRICES WITH SCALING

By Cristian Ramirez Rodriguez of the University of New Brunswick, Fredericton, New Brunswick
1st Prize Winner, Literature

Identity, σ_0

$$I = C_0 \sigma_0$$

$$I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$C_0 = 1$$

An electron from a complex molecule
in a Rydberg state
sees itself as a hydrogen atom
with a rapidly rotating core structure.

Far from home
a tendency to simplify
the old home ground arises
while the past holds presence.

The present holds heartbreak,
an incidental product of excited separation
across a well-defined boundary
and the measurement of time.

Identity can be defined
as the distance between
perception and measurement.
Interferometric precision comes from the cold.

Ex, σ_x

$$\sigma_1 = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$$

$$A = C_1 \sigma_1$$

$$A = \begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$$

$$C_1 = -1$$

An atomic physicist told me
"disarmament is the sign of a mature civilization"
and that any worthwhile measurement
is worth measuring twice.

The two classical idioms assume
measurement does not irrevocably alter the state
when even the suspicion of WMDs
may lead to regime change.

As troops surround the nation
where all my grandparents lived
I watch Maria win a Nobel prize for her attempts
to achieve "a peaceful transition" to democracy.

She shares the name of an ex-girlfriend who gave
me an oversized sweater for winter mornings
before the border crossing and the breakup.
When I grew into the sweater, how disarming it was.

Why, σ_y

$$\sigma_2 = \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix}$$

$$M = C_2\sigma_2$$

$$M = \begin{pmatrix} 0 & -mi \\ mi & 0 \end{pmatrix}$$

$$C_2 = m$$

Lightning bugs produce circularly polarized light.
In northwestern Venezuela the Barí peoples claim
lightning storms come from the ancestors
who return to the earth as celestial fireflies.

Grief is also circular. I remember fireflies
and dancing with abuelita when the Aurora arrives.
In Cree, the Northern Lights are "wâwâhtêwak,"
or "kâ-nîmihitocik," they who dance in a circle.

This year I learned
cyclic variables depend on the reference frame
and the life cycle of a relationship
depends on whether it survives a migration.

If entangled observables
are translation independent
why does a lightwave collapse upon measurement
with no memory of previous states?

Rest, σ_z

$$\sigma_3 = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$

$$T = C_3\sigma_3$$

$$A = \begin{pmatrix} e & 0 \\ 0 & -e \end{pmatrix}$$

$$C_3 = e$$

Mistranslation is an art form
amplified by notation.
To the one who split the atom
entropy's arrow becomes death.

Semiclassically, cooling bosons to a phase space
density that produces a new state of matter
requires the removal of the most energetic elements
in an atomic ensemble following a MB distribution.

Evaporative cooling carries
a macroscopic analogy:
eight million Venezuelans left the country
including every major opposition leader.

How could I translate the dream
of returning to a forgotten home
when the precisely defined energy levels lead
to greater uncertainty in the destroyer of worlds?

$$I = AMTi(me)^{-1}$$

DESCRIPTION BY AUTHOR:

The poem, "Pauli Matrices With Scaling Factors" refers to the set of 2x2 matrices which can represent the polarization states of light. I wrote the poem in the Quantum Sensing and Ultracold matter lab in Fredericton, New Brunswick, Canada while thinking about my family in Venezuela and working on improving our atom interferometer through an evaporative cooling stage.

SUPERPOSITION: FOR THOSE WHO DREAM IN PROBABILITIES

By Abiy Nedie of MacEwan University, Edmonton, Canada
2nd Prize Winner, Literature

I walk where light decides,
a boundary of maybe ...
half-step in the world that is,
half-step in the world that might be.

My shadow collapses first,
choosing a single truth
while I wander the branching paths
like a rumor of myself.

In the hush between wave and particle
I feel the pulse of possibility ...
the quiet electricity
of a universe that has not yet made up its mind.

Here, uncertainty is not a flaw
but a doorway:
a promise that even the smallest thing
can rewrite the cosmos.

So, I breathe in the quantum dawn
where reality shimmers uncommitted ...
and for a moment
I, too, am infinite.

DESCRIPTION BY AUTHOR:

This pairing brings the reader into a world poised between certainty and possibility. In the image, a lone figure stands at the threshold of a glowing portal, facing a spiraling cosmos that feels both distant and intimately connected by thin, red threads of light. The figure becomes an observer whose act of perception will crystallize their fate, echoing the poem's meditation on superposition; the space where reality hesitates, where every step is both taken and not yet taken. The warm light behind them evokes the solidity of the known world, while the swirling galaxy ahead embodies Hilbert space "ghost-selves," a realm where identity softens into probability. This quiet contrast of gold and deep blue amplifies the poem's sense of shadow, branching paths, and truths waiting to collapse into form. Together, image and text create an atmosphere of soft wonder; a gentle invitation to inhabit uncertainty not as a fear, but a doorway into infinite potential.
Disclaimer: I wrote the poem. I used AI for the image. I also polished a few of my words using AI.

OH QUANTA!

Par Richard Germain, Pointe-des-Cascades, Québec
Mention honorable, littérature

Ma conscience s'éveille
Je suis observateur du Soleil
Il m'envoie son rayonnement chaleureux
Mais était-il dans cet état avant mon regard curieux?

Dans cet Univers où règne l'incertitude innée
Le déterminisme a fait place à la probabilité
Je voudrais faire la lumière sur cette nature voilée
Alors que la nature de la lumière est une dualité

En quête d'un modèle standard, toujours je sonde
J'observe l'effondrement des fonctions d'ondes
Ainsi que les actions fantômes à distance qui me confondent

Mon esprit spin en rêvant d'intrication
Et je suis en décohérence en songeant à des chats vivants et non

Je sens venir en moi une catastrophe ultraviolette
Quand le monde me confronte à un corps noir à énergies discrètes
Par principe, pas d'exclusion simplette
Je dois laisser le quantique me prendre dans ses bra-kets

J'ai l'impression d'être sur le BOHR du puits de potentiel
Lorsque la vérité me frappe; PLANCK!! Enfin la beauté du réel!
Transistors, qubits, lasers, IRM, CMOS et DEL
Les quantas donnent à ma vie un ASPECT sensationnel.

WINDCHIME #13

By Stefanos Kourtis, Université de Sherbrooke
1st Prize, Performing Arts

Listen online: https://iyqcda.cap.ca/wp-content/uploads/2026/02/QuantumWindchime-Windchime13Exposition-Stefanos-Kourtis.mp3

DESCRIPTION BY ARTIST:

Windchime #13 is inspired by the theory of quantum magnetism. "Snapshots" of a wavefunction modeling magnetically interacting electrons (Hubbard model) are taken during its time evolution and translated into a musical score.

QUANTUM GATES

By Graeme Dyck of the University of Saskatchewan, Saskatoon, Saskatchewan
2nd Prize, Performing Arts

View on YouTube: https://youtu.be/BQXQarihfKw .

DESCRIPTION BY ARTIST:

'Quantum Gates' was an interactive audio installation that explored the logic of gate-based quantum computing through electronic music. Participants wandered through the soundscape created by a ring of four speakers and modulated it using buttons in the centre of the space. Each speaker corresponded to one qubit in a quantum computer model and produced sound according to the state of the qubit in the system, moving between musical sound (1) and textural noise (0). A pad labelled with quantum gate diagrams allowed users to apply gates to the system and hear its state change around them. With 16 different gates available and a faithful Hilbert space model of the 4-qubit system, participants could hear phenomena like entangled Bell states and build circuits such as Feynman's 1986 quantum adder. Different operations and post-measurement states revealed varied musical textures that participants could explore while building a sonic intuition for quantum logic.

QUANTUM BLOOM

By Julie Bélanger of Université de Sherbrooke, Sherbrooke, Québec
1st Prize, Visual Arts

Quantum Bloom
Julie Bélanger, 2026

DESCRIPTION BY ARTIST:

Quantum Science is a constantly growing field nourished by scientists such as physicists, engineers and mathematicians all over the world. It is composed of three major schemes: the foundation concepts (i.e. the roots) such as quantum hardware and linear algebra, the core concepts (i.e. trunk) like quantum information, quantum computation and software developments, and finally the numerous possible applications (i.e. the branches). If you take a closer look, you will notice that each part of the tree is composed of quantum lexicon related to the respective scheme. In principle, each terminology appears only once; a word can appear many times since it can be used in a different expression. For instance, the roots section contains: Josephson junction, orbit and ion trap. The trunk section contains among others: Deutsch's algorithm, Hamiltonian and tomography. Examples of words in the branches section include quantum finance, DNA computing and cryptography.

Disclaimer: This project is created with the help of Canva, an online design platform. Each word has been meticulously and individually added and scaled to form a tree pattern. No artificial intelligence has been used.

SCHRÖDINGER'S STEREOGRAM

By Sareen Sabra of the University of Windsor, Windsor, Ontario
2nd Prize, Visual Arts
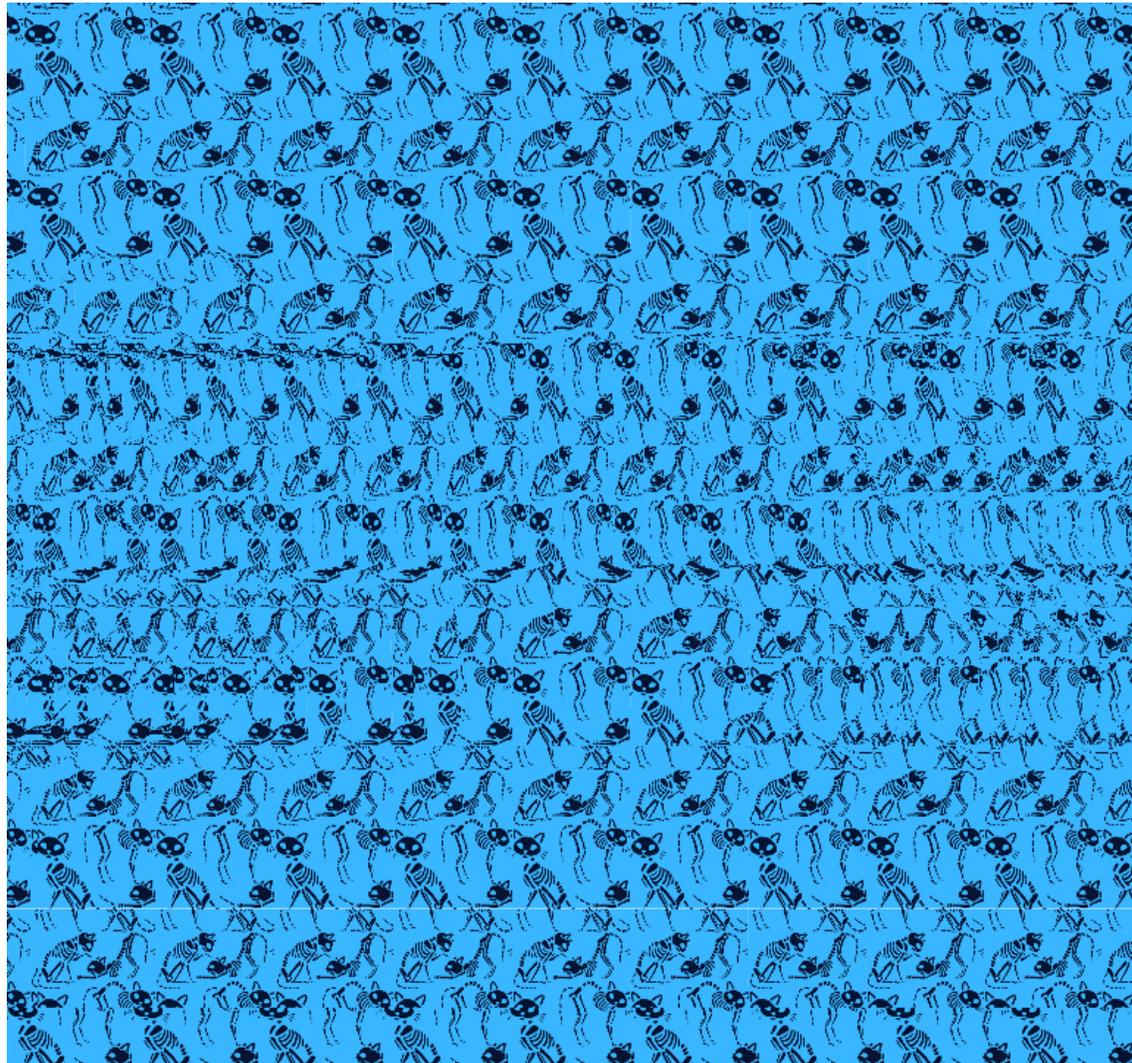
DESCRIPTION BY ARTIST:

Cross your eyes and focus on the image to reveal a hidden surprise. A stereogram is a two-dimensional image that creates the illusion of depth through binocular disparity, allowing a three-dimensional form to emerge only when viewed in a specific way. Just as in quantum systems, the noisy background suggests multiple possibilities coexisting simultaneously as we see in superposition and quantum mechanics' probabilistic nature. Yet, beneath this apparent randomness lies hidden information, highly sensitive to how it is observed. When you uncross your eyes, the image collapses, but cross them just right, and the concealed pattern emerges, capturing the true essence of quantum mechanics. Finally, the choice of a dead cat as the background and a living cat as the depth image pays homage to Schrödinger's famous thought experiment!

NANOSCALE DIAMOND MICROLINK RESONATOR

By Elham Zohari of the University of Alberta, Edmonton, Alberta.
3rd prize, Visual Arts
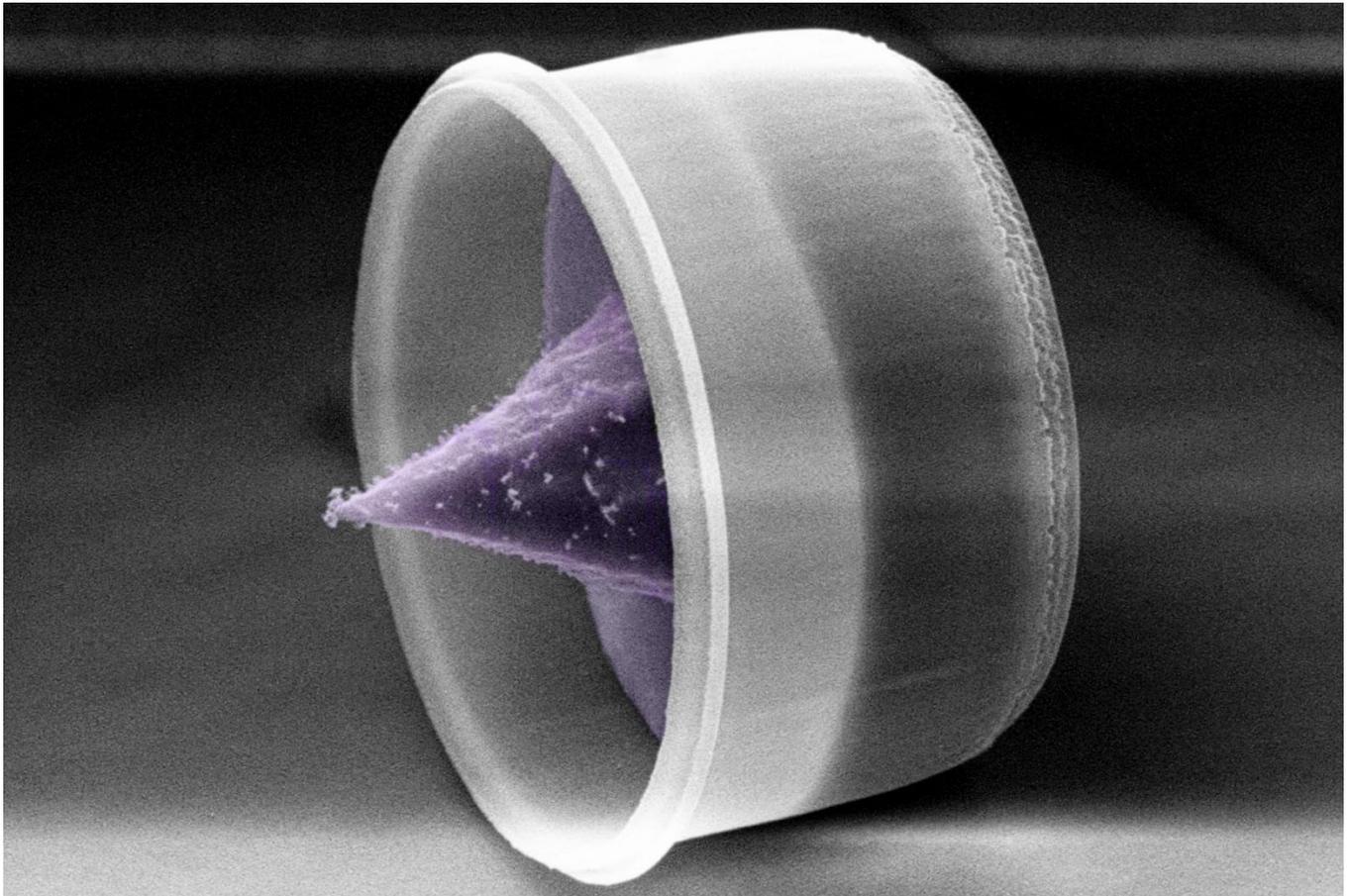
DESCRIPTION BY ARTIST:

This image shows nanoscale diamond microdisk resonator, a structure engineered to confine and control light for quantum technologies. While diamonds are most commonly associated with jewelry, they also possess exceptional properties at the quantum level. Embedded within the crystal lattice of this microdisk are nitrogen-vacancy (NV) centers, atomic-scale defects formed when nitrogen atoms replace carbon. These defects can store and manipulate quantum information, making diamond a platform for quantum memory applications. The microdisk is false-colored pink to reference the natural hue of pink diamonds, which arises from nitrogen-related defects in the crystal. This visual choice connects a familiar gemstone aesthetic to the same atomic features that enable quantum functionality. By highlighting this shared origin of color and information storage, the image bridges everyday intuition and advanced quantum science, inviting viewers to see diamonds not only as objects of beauty, but as engineered materials shaping the future of quantum technologies

VISUAL ARTS HONOURABLE MENTIONS

**Untitled** by Ruvé Staneke of theUniversity of British Columbia

Entanglement by Amelia Alcock-White, Vancouver, BC (https://ameliawhite.net)

Untitled by Hansima Keppetiyawa of Brock University

This SEM image flips into a pixelated pond party! Accumulated Titanium Carbide MXene flakes bloom into leafy aquatic plants, while a long, layered flake struts through the scene as a goldfish, surrounded by smaller companions. The untouched silicon substrate resembles crystal-clear water, unveiling a peaceful world imagined at the nanoscale. The original SEM image is shown on the right.
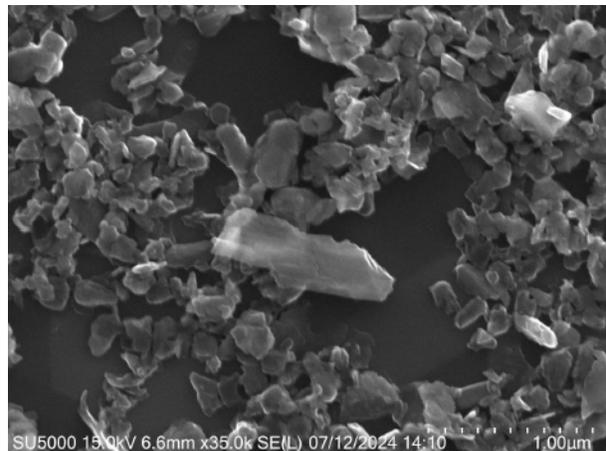
THE CAP-IYQ 2025 LOGO DESIGN COMPETITION / CONCOURS DE DESSIN DE L'ACP-IYQ 2025

The CAP invited all physics students in Canada to create a design for the Canada-wide celebration of the International Year of Quantum Science and Technology (IYQ) – and to compete for the prize of $1000, and see their design on t-shirts, mugs, and more distributed across the country in 2025.

1ST PLACE WINNER CAP-IYQ 2025 LOGO DESIGN

Congratulations to the IYQ Design Competition winner – Jasmine Zhang of the University of British Columbia – whose striking design was used for pins, stickers, and buttons that have been brought to events celebrating IYQ across Canada and the world, including the UNESCO Opening Ceremony in Paris, France.

Jasmine Zhang is a first-year PhD student at the University of British Columbia working with the T2K/Hyper-K group at TRIUMF. They are honoured to have their design chosen for the CAP IYQ 2025 competition. Their design represents a superposition of quantum-driven technological advancements and the fundamental physics underlying the natural world. The orientation of the two halves of the Canadian maple leaf is a nod to the familiar orthonormal basis for the spin-1⁄2 particle.

This design superimposes quantum science and the iconic Canadian maple leaf. The leaf is split into two halves, oriented oppositely to evoke the familiar orthonormal basis for the spin-1⁄2 particle (spin-up and spin-down). One half of the leaf is interwoven with circuit patterns, representing the technological advancements driven by quantum mechanics. The other half features a flowing waveform, symbolizing the natural phenomena and foundational principles of quantum mechanics. Together, these elements reflect the balance between innovation and the deeper understanding of the natural world fostered by quantum research.
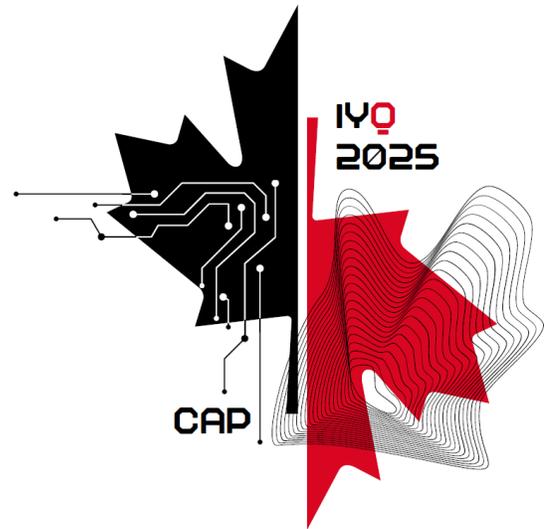
## CAP-IYQ 2025 LOGO DESIGN COMPETITION HONOURABLE MENTIONS

Pierre Lefloïc from the University of Sherbrooke uses their design to highlight the work Canada has contributed to the international field of quantum physics. The focus of this design in particular is on quantum information, qubits, and current research in reducing quantum errors in computing fields.

Sareen Sabra, an undergraduate at the University of Windsor, chose to do a diffraction pattern in the shape of a Canadian maple leaf as a nod to the quantum-physical nature of particles. Sareen chose to draw out the diffraction lines to highlight how the current understanding of the quantum mechanical nature of the world is still incomplete, and the future of our understanding that Canada will contribute to.

Isaac Bahler from Dalhousie University was inspired by Louis Taillefer, the first Canadian winner of the Simon Memorial Prize in 2017. Isaac nods to the lattice structure of cuprate superconducting materials, as well as the superpositional nature of particles according to quantum theory. Isaac also used the DALL-E 3 generative engine to aid in the design process, drawing inspiration from various related scientific papers.
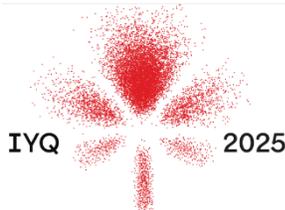
Shane Ackerley, who holds a B.Sc. in Astrophysics from Western University, submitted this design as a versatile, minimal, and meaningful design for the International Year of Quantum in Canada. The maple leaf, an icon of Canada, is re-imagined through the lens of quantum physics. Shane made the design with Python using a custom script to plot solutions to the Schrödinger equation of a Hydrogen 4fz orbital and modified it slightly to represent the stem of the maple leaf.

Ryan Naderi at Simon Fraser University produced a design which prominently features the Canadian Flag, as well as the classical model of an atom devised by Ernest Rutherford. Although newer and more accurate models of atomic interactions have been developed, this design outlines that it is important to understand the steps physics has made to get where we are today.

ACKNOWLEDGEMENTS