



2024 YEAR IN REVIEW

PENN
CENTER FOR
NEUROAESTHETICS

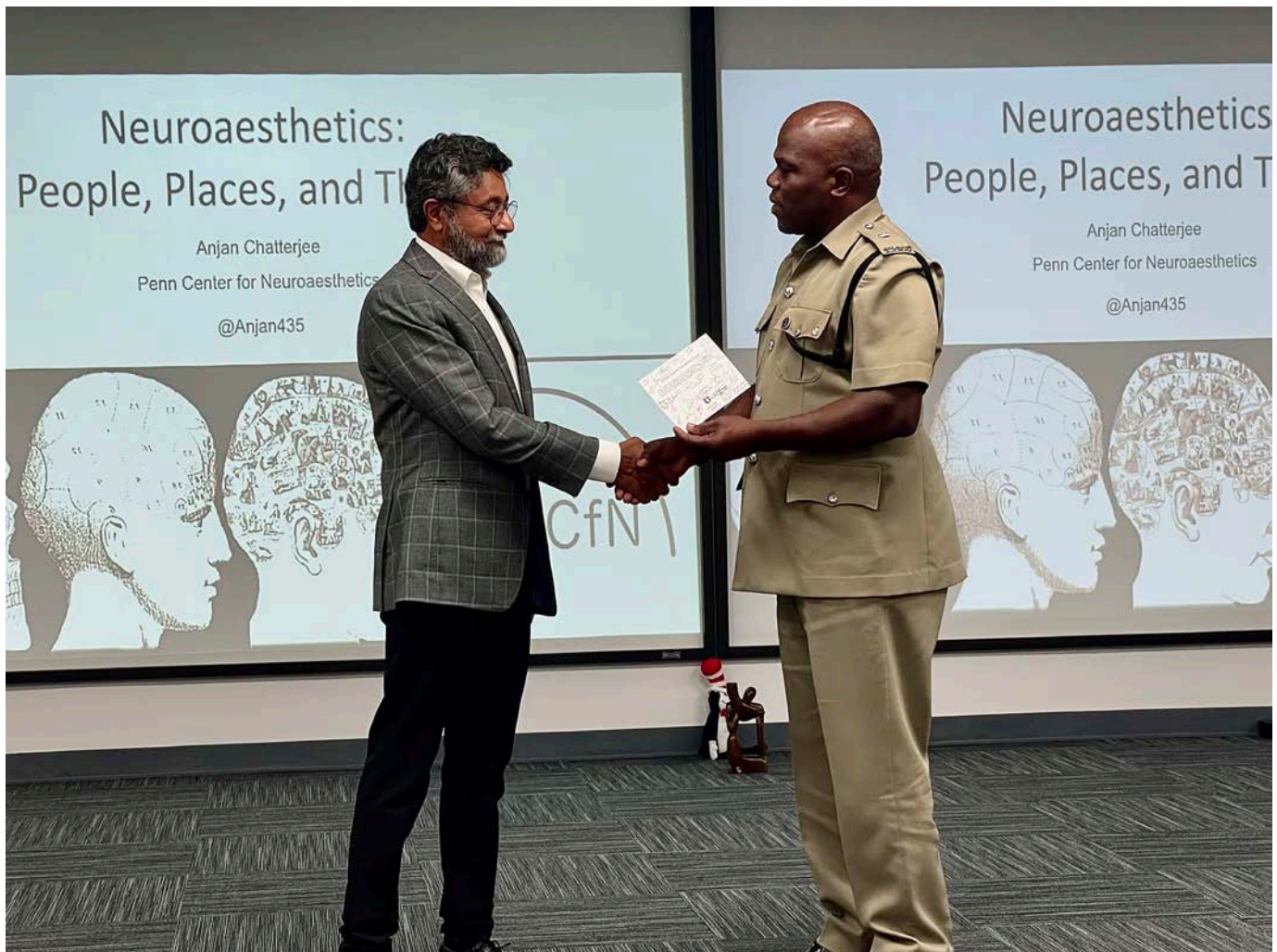


MESSAGE FROM THE DIRECTOR

“We don’t want to make our men soft!” the Colonel from Ghana growled during a neuroaesthetics discussion I was leading. We were in a dreary room at a NASA base in the sweltering Louisiana heat. My host, a retired U.S. Navy Seal special forces member, jumped in: “Dr. Chatterjee is not talking about making soldiers soft. He is talking about making them resilient.” This interaction highlights two dominant themes from 2024. Firstly, my professional role led me to venues to which I could not have previously imagined being invited. Secondly, it highlighted

the idea that aesthetics can be a force for good, perhaps even more so in uncertain times.

My talk in Louisiana was part of a Strategic Leadership Initiative Course in which future military leaders from more than 30 allied countries in Africa, Latin America, Southeast Asia, and Eastern Europe participated in a month-long course. The idea behind the initiative is to encourage these leaders to think beyond conventional training and to connect with their humanity. The conversation with this otherwise reserved group erupted after the “soft” comment, delving into post-traumatic stress, depression, suicide, and how aesthetics might mitigate hidden wounds in a soldier’s psyche.





In addition to giving more typical scientific talks in Palma, Istanbul, Katowice, Vienna, and Torino, the year led me to unusual conversations like the one in Louisiana. I visited an NBA franchise to look at their training facilities. The organization will be designing new facilities and was interested in my thoughts on how design could promote the well-being of their players and allow them to perform at their peak. In Arizona, I visited an art exhibit I had helped organize over the previous year and a half. The exhibit at the Scottsdale Museum of Contemporary Art was structured around principles of neuroaesthetics. The curator and I gave a public tour using the art to educate visitors about scientific aesthetics. The show garnered enough attention that PBS produced a News Hour segment about the exhibit and neuroaesthetics. Finally, the year capped off with an invitation to the Mediterranean Tourism Forum in Malta. I participated on a panel moderated by a BBC travel reporter along with a Michelin star chef and a global tourism expert. We discussed beauty, art, and culture before an audience of tourism professionals and politicians from Spain, Italy, Greece, Turkey, Egypt, Tunisia, Morocco,

and other countries around the Mediterranean. I was honored to receive a "Big Sea Award" for work on the perception of beauty, presented by the President of Malta, Her Excellency Ms. Myriam Spiteri Debono.

Neuroaesthetics is at a tipping point, seeping into seemingly unlikely territories, as my experience with military leaders, basketball professionals, museum curators, and the tourism industry demonstrates. Despite playing ambassador for neuroaesthetics to a broad swath of constituents, our work remains rooted in the scientific method, advancing knowledge by conducting fundamental and applied research. The different conversations attest to the wide relevance of our work on how human appearance modulates social interactions, how the built and natural environment affects our well-being, and how art serves as a vehicle for self-discovery. In a fragmented world, where war and its victims are on daily display, civil institutions and free speech are under assault, and people feel alienated and lonely, we believe that aesthetics can serve as a counter-resistance, from providing succor and bringing us together to promoting individual and communal flourishing.

Looking ahead to 2025, the science of aesthetics and its applications remain vital. We continue to lay the foundations for the PCfN's financial sustainability and appreciate the support from the National Endowment of the Arts, the Creative Forces, the Templeton Religion Trust, and the Renée Fleming NeuroArts Award. We rely on and are deeply grateful for generous philanthropic donations and remain dedicated to the proposition that aesthetics embodies our deepest values and profoundly affects human interactions, health, and well-being.

Handwritten signature of Anjan Chatterjee, M.D.

Anjan Chatterjee, M.D.

ABOUT US

The PCfN launched in July 2018 with support from the University of Pennsylvania's Provost Office, The Perelman School of Medicine Dean's office, The Department of Neurology, The Department of Radiology, and The Center for Human Appearance. Ours is the first center in the US—and perhaps the world—dedicated to advancing cognitive neuroscience research in aesthetics.

The PCfN is motivated by a belief in the fundamental value of aesthetic experiences—they nourish the human spirit, inspire creativity and innovation, stimulate thought, bring people together, catalyze personal and social transformation, express values and meaning, and reveal the human condition.

Our Mission:

- Advance research in basic and applied neuroaesthetics
- Educate the next generation of scientists
- Promote allied interdisciplinary interests
- Welcome investigators and creative experts
- Disseminate our science and engage with the arts community

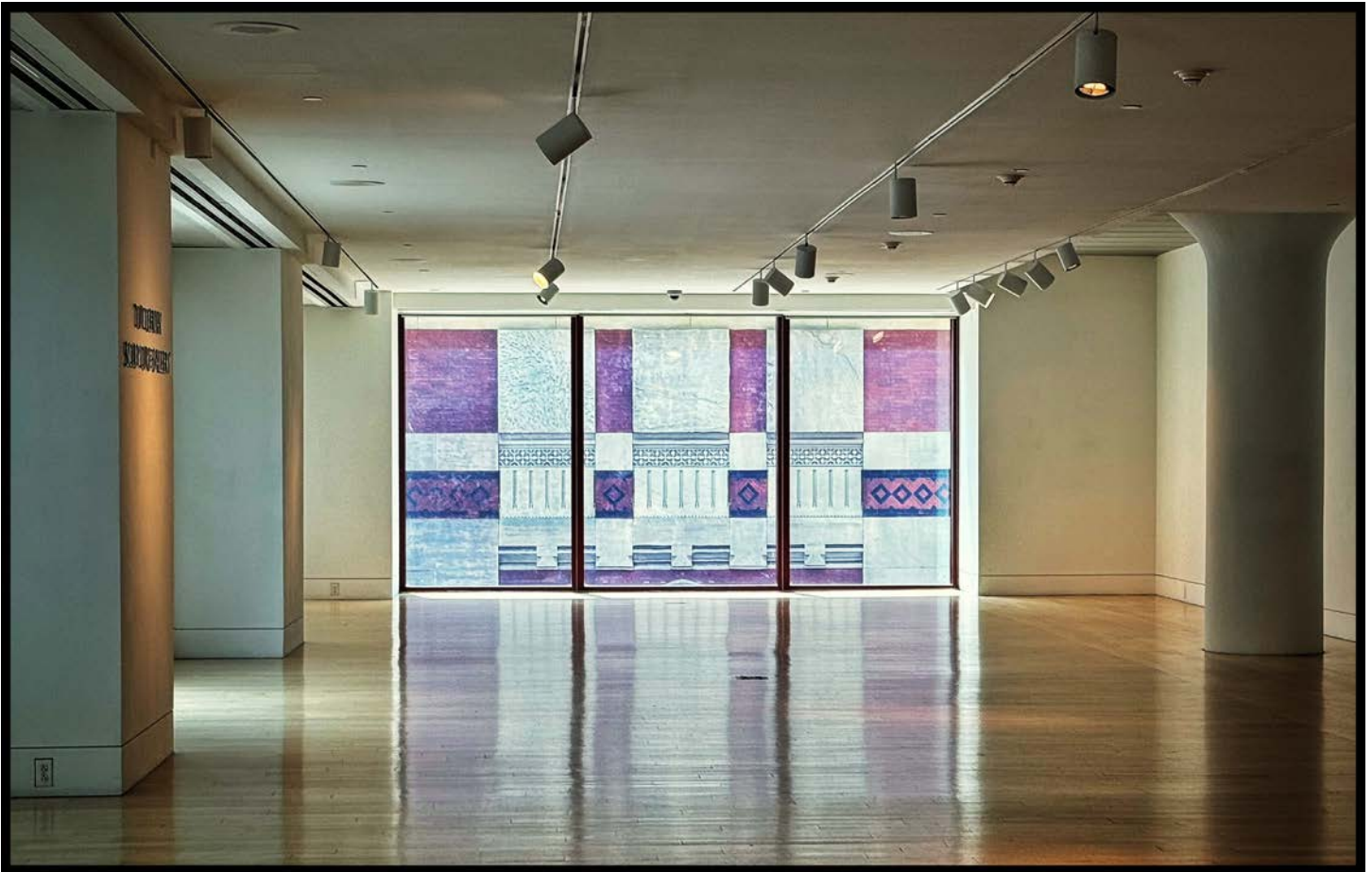
**BEAUTY AND
MORALITY**

**ENGAGEMENT
WITH ART**

OUR
RESEARCH GENERALLY
FALLS INTO ONE OF THREE
CATEGORIES

**THE BUILT ENVIRONMENT
AND WELLNESS**





ADVISORY BOARD

- **Pauline Brown** - Global luxury brand expert and author of *Aesthetic Intelligence*
- **Andrei Codrescu** - Poet, novelist, essayist, Peabody Award-winning filmmaker, and former NPR commentator
- **Susie Ellis** - CEO and chair of the Global Wellness Institute and Summit
- **Sheri Parks** - Cultural strategist, former VP at MICA, and a scholar of American Studies
- **Laurie Racine** - Seasoned strategist and executive who leads growth-stage companies and nonprofits
- **Gabrielle Starr** - President of Pomona College and scholar in neuroscience and aesthetics
- **Román Viñoly** - CEO of Integrated Developments and board chair of The Viñoly Foundation
- **Dan Weiss** - Former President and CEO, Metropolitan Museum of Art
- **Paul Zoidis** - Former investment banker whose philanthropic efforts focus on helping underserved students

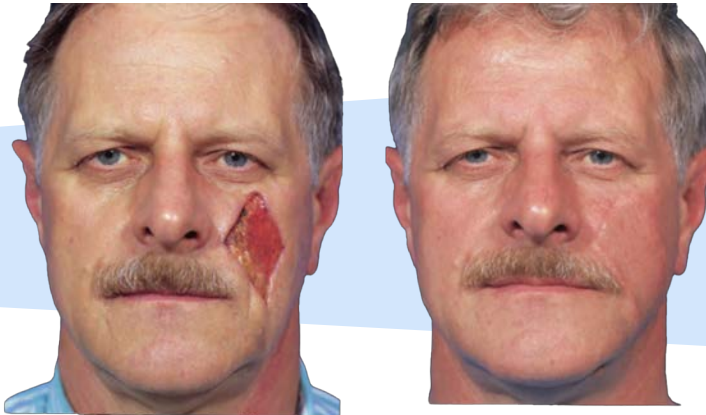
IMPACTFUL RESULTS

FIRST IMPRESSIONS

A glance is enough to assign psychological attributes to others. We continue to study biases against people with scars and palsy. In a recent study, we found that faces with an anomaly are judged to be **less warm and less competent** than their healed counterparts.

These people are also **dehumanized** in two ways - viewers judge them more similarly to animals and machines than people without anomalies.

At the PCfN, we believe awareness of these harmful biases is a necessary step to begin to address them.



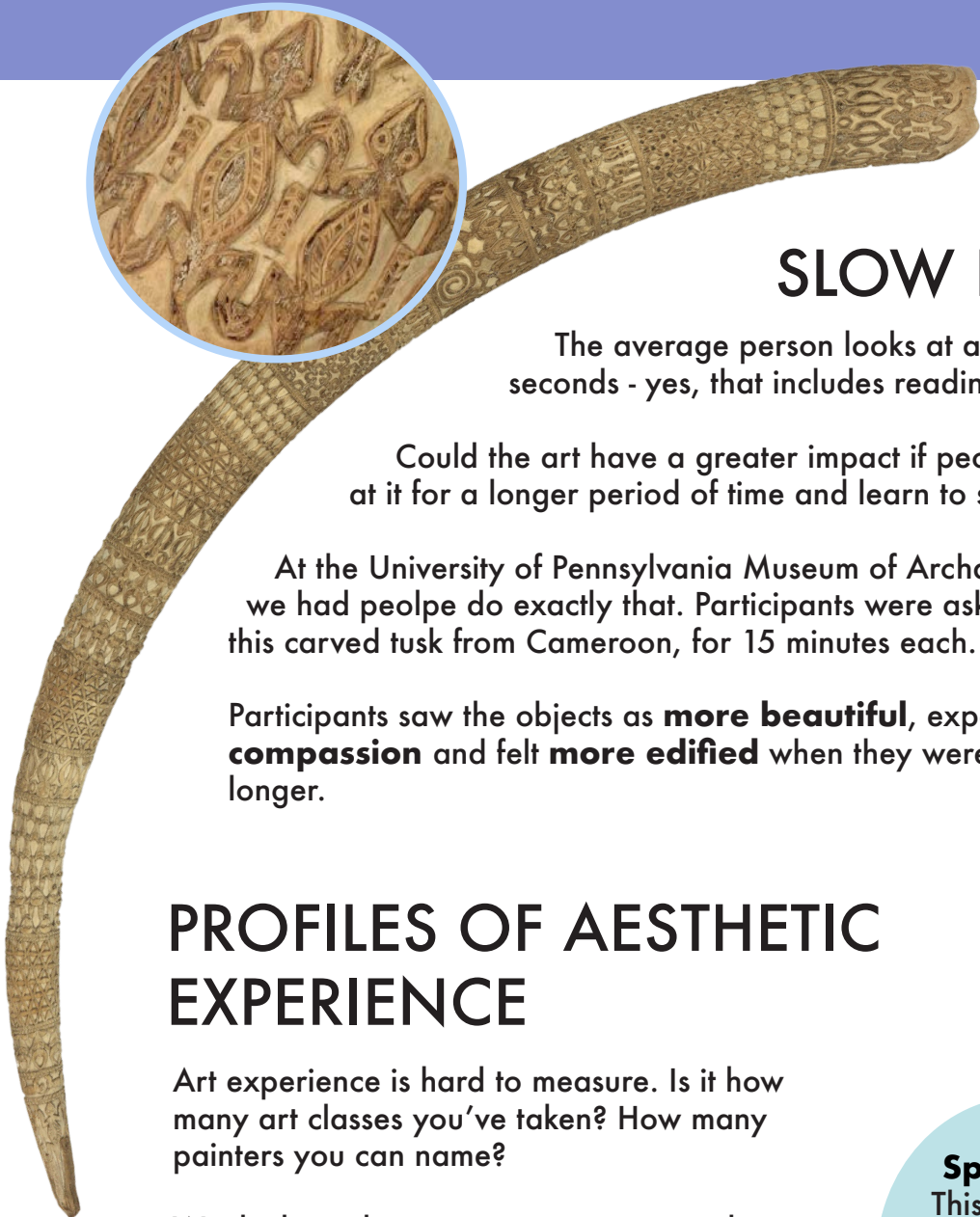
BIOPHILIC DESIGN - MADE VIRTUALLY

Our center is one of the first to study formally the cognitive and behavioral effects of nature-inspired design. This year we took the work a step further by assessing these environments in virtual reality.

If VR environments generate the same kinds of responses as real environments, it could serve as a critical tool for future experiments.

Ongoing studies show promising results and we look forward to continuing this work in 2025.





SLOW LOOKING

The average person looks at a work of art for only 27 seconds - yes, that includes reading the plaque.

Could the art have a greater impact if people were prompted to look at it for a longer period of time and learn to savor the experience?

At the University of Pennsylvania Museum of Archaeology and Anthropology, we had people do exactly that. Participants were asked to view objects, such as this carved tusk from Cameroon, for 15 minutes each.

Participants saw the objects as **more beautiful**, experienced **more compassion** and felt **more edified** when they were present with the art for longer.

PROFILES OF AESTHETIC EXPERIENCE

Art experience is hard to measure. Is it how many art classes you've taken? How many painters you can name?

We think aesthetic experiences are much more than that - time spent admiring murals or watching a concert on YouTube count as art engagement too. Our new survey, funded by a grant from the National Endowment of the Arts, is a **comprehensive and inclusive** measure.

We find that people fall into 5 profiles:

Indifferent:
This person has a minimal relationship with the arts

Enthusiast:
This person loves art - as long as they don't have to pay for it

Spectator:
This person is characterized by their aesthetic engagement online

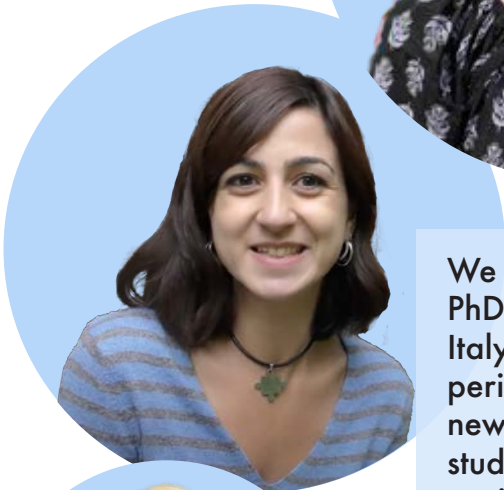
Devotee:
This person is well-read and knows what's happening around town

Aesthete:
This person is highly engaged with different forms of media and art-making

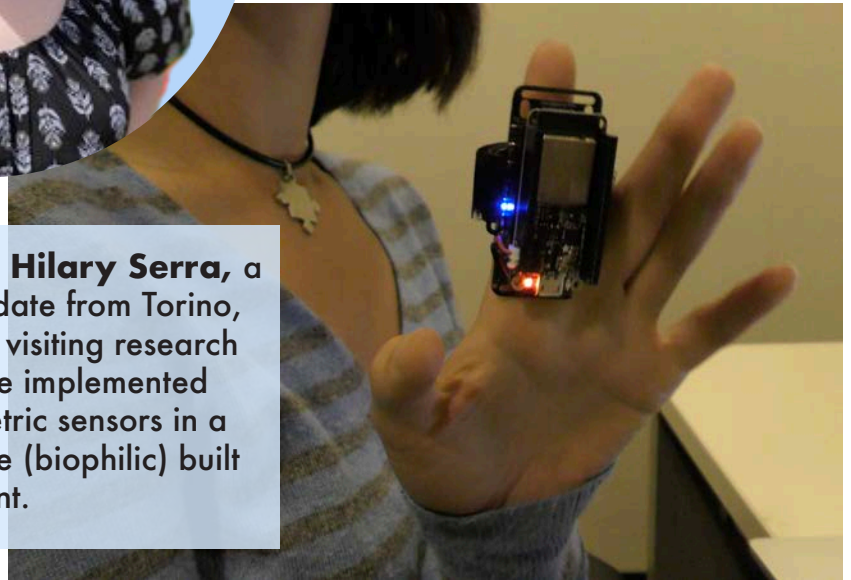
PCfN MEMBER HIGHLIGHTS



Hannah Merseal joins us as a postdoctoral researcher from Penn State, where she recently completed her PhD focusing on creativity. She brings strong statistical skills, passionate science advocacy, and her lovely cat Matcha.



We hosted **Hilary Serra**, a PhD candidate from Torino, Italy, for a visiting research period. She implemented new biometric sensors in a study of the (biophilic) built environment.



Mariola Paruzel-Czachura was recognized as one of the top 5 social scientist researchers by USERN. She also received several awards from the University of Katowice.

We welcomed two new members to our Advisory Board. **Laurie Racine** brings a sharp business sense and strategic outlook, having worked extensively with start-up organizations.

Andrei Codrescu, an acclaimed poet, writer, and former NPR commentator, helps us evaluate our most basic assumptions with his characteristic penetrating wit.





Jeffrey Vadala and Anjan Chatterjee were awarded the new prestigious **Renée Fleming NeuroArts Investigator Award** to further our work in AI and VR.



Judith Schaechter, our artist-in-residence, received the Smithsonian Visionary Award for her “incomparable artistry and unique creative vision” in stained glass.



Anjan Chatterjee received the “The Big Sea Award for Promotion of Aesthetic Beauty” at the Mediterranean Tourism Forum.

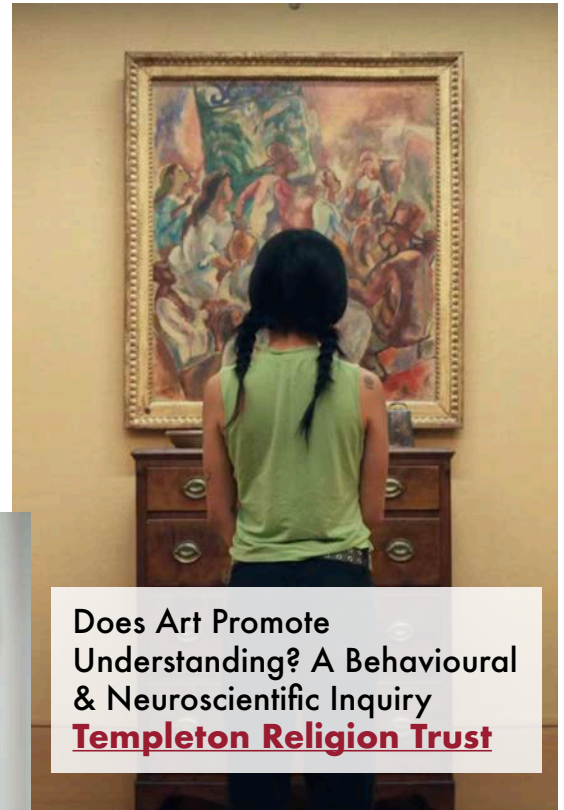


Nine members of our lab (pictured here with alumni) proudly represented us at the biannual meeting of the **International Association of Empirical Aesthetics** in Palma, Mallorca.



OUR REACH IN ACADEMIA AND BEYOND

19 NEWS ARTICLES AND PODCASTS



Does Art Promote Understanding? A Behavioural & Neuroscientific Inquiry
[**Templeton Religion Trust**](#)



'Brains and Beauty' explores how the mind processes art and aesthetic experiences
[**PBS News Hour**](#)



[**Decoding Beauty**](#)
Now available on Amazon Prime



South Philly stained glass maker explores art, science at Penn Center for Neuroaesthetics
[**WHYY**](#)



[**Arts and Wellness Panel**](#) at the Kennedy Center

[AND MORE ON OUR WEBSITE](#)

39 INVITED TALKS AND LECTURES

- The Seduction of Human Beauty: Behavioral, Neural, and Cultural Factors. Neuroscience Seminar. **Brainy Days 2024**. Florida Atlantic University. March 2024
- Aesthetic Experience and its Discontents. Symposium. **International Association of Empirical Aesthetics**. Palma, Mallorca. May 2024
- Art, Architecture, and Human Well-being. Presented as keynote lecture at:
 - **Annual Meeting of the Polish Social Psychology Society**. Katowice, Poland. September 2024
 - **Third Annual Conference on Beauty and Change: Aesthetics and Human Flourishing**. Torino, Italy. October 2024
- Art and Architecture as Vehicles for Change. Keynote lecture. **Spirituality and Health Symposium**. University of Pennsylvania. Philadelphia. October 2024

13 CONFERENCE POSTERS AND PUBLICATIONS

Darda, K. M., & Chatterjee, A. (2024). **Cross-cultural Aesthetics: Aesthetic Contextualism and Ingroup Bias.** Journal of Comparative Literature and Aesthetics

Paruzel-Czachura, M., Workman, C. I., El Toukhy, N., & Chatterjee, A. (2024). **First impressions: Do faces with scars and palsies influence warmth, competence and humanization?** British Journal of Psychology

Estrada-Gonzalez, V., Chatterjee, A. and others (in press). **Art therapy unmasked: Evaluating emotional shifts in art therapy masks.** Scientific Reports

Chatterjee, A., Leder, H. et al (2024). **Remembrances of Paul Locher.** Empirical Studies of the Arts

PUBLICATION
SPOTLIGHT

Dr. Chatterjee regularly writes for Psychology Today on topics related to aesthetic research. These blogs are often highlighted as “Essential Reads” by Psychology Today editors. This May blog post, viewed over 1,500 times, describes our thinking about the present moment.

THE NEW ROMANTICS: Are we witnessing a movement in science and the arts?

A Modern Malady

On January 30, 2024, the White House Domestic Policy Council and National Endowment for the Arts co-hosted an event called, “Healing, Bridging, Thriving: A Summit on Arts and Culture in our Communities.” The title of the event begs questions. What needs to be healed? What is to be bridged? Why aren’t we thriving?

Soon after, on March 1, the wellbeing organization Therme U.S. hosted a panel at the Kennedy Center with the title “We Are Connected Through Trees: New Frontiers of Biophilia.” The panel (which I was a part of) discussed projects that “reinvigorate our relationship to the natural world—from experiments in biophilic design, community-led forest bathing, and radical art installations...” The very notion of re-invigoration implies a state of depletion—that something vital has been lost. These two gatherings, among others of their kind, point to a current state of discontent and alienation. They might also represent the beginnings of a reaction to this malady—a New Romanticism.

The Old Romantics

The old romantics reacted to the unfortunate consequences of the Industrial Age. The late 18th and early 19th centuries produced profound scientific, cultural, and political changes in Europe. The scientific revolution changed how we thought: animals, plants, and matter could be measured and classified and their properties quantified. Nature could be grasped. Otherwise,



mysterious forces like heat, light, steam, electricity, and magnetism were harnessed to drive progress. The Industrial Age, in the wake of the scientific revolution, produced innovations like steam engines, textile mills, and the telegraph. Life changed dramatically. Nature was domesticated, resources extracted, and presumably, people’s lives improved.

Despite good intentions, the material benefits of the industrial age came at a price. Cities were polluted, workers were oppressed, and nations fought for resources. People felt removed from nature and each other. Prosperity for some meant peril for others. An extractive approach to the world encouraged the cultivation of monoculture cash crops like indigo, sugar, and cotton. A distancing of the "other" and a Reacting to the ills of the time, the Romantics tried to transform the prevailing zeitgeist. The movement, hard to define and lacking clear boundaries, reoriented people to the importance of their inner lives. In Germany, at the end of the 18th century, a group of thinkers opposed a view of progress in which quantity replaced quality and reason triumphed over emotion. Led by Johann Wolfgang von Goethe, the poet-playwright-scientist, the group included intellectuals, poets, performers, and scientists. Alexander von Humboldt, the most famous scientist of the time, emphasized our integral connection to nature. Romantic sentiments spread to and took root in England with poets like Coleridge, Keats, and Shelley. Despite differences, the Romantics, as a group, underscored the importance of emotions and viewed the world as an organic whole rather than a grab-bag of mechanical parts. Importantly, art, aesthetics, and a deep connection to nature were antidotes to their diagnosis of an age of disenchantment.

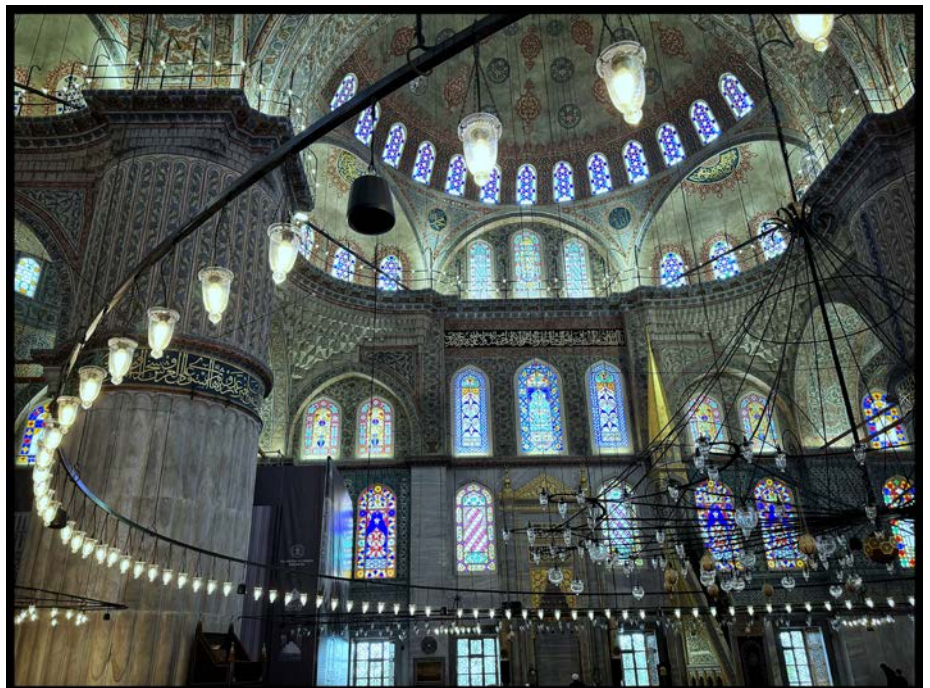
The New Romantics

The world today seems once again fractured. Analogous to how the scientific revolution gave way to the Industrial Age, the information revolution of the 20th century is giving way to the Digital Age of the 21st. Information, itself a mysterious force, is being harnessed presumably for good. Data, some say, is the new oil. A web encircling the wide world has made the planet smaller, more connected, and more graspable. The Digital Age has accelerated science, eased

communication, enhanced commerce, created jobs, democratized access to knowledge, and improved our material lives.

Despite the substantial gains of globalization and information technology, many people remain unhappy. The Surgeon General identifies loneliness as an epidemic. Teenagers in America are deeply pessimistic and more anxious, depressed, and inclined to suicide than previous generations. Teachers are burned out and education systems are under assault. The American healthcare system is creaking under the weight of its bureaucracy. Civic values and political institutions are crumbling. Artificial intelligence, the hypertrophic child of the Digital Age, is making it difficult to trust our senses and tell fact from fiction.

We are haunted by failures too big to comprehend. Will we face mass extinction if we disregard the climate crisis? Are we raising machines that will grow up to dominate us? The signs and symptoms of the current malady are similar to those to which the Old Romantics responded. The good intentions of science and technology have gone awry. An extractive and ultimately exploitive approach to the world renders many workers alienated and demoralized. People are disconnected from nature and fragmented from each other.



Like two centuries years ago, an unlikely group of people are converging to combine science, nature, art, and aesthetics. Traditional disciplinary and professional boundaries are breaking down. World-class performers like Renée Fleming and David Byrne are talking about neuroscience. A new generation of architects and designers is preoccupied with neuroscience and re-evaluating our place in nature. Artists and intellectuals are emphasizing our emotional connection to beauty. Neuroscientists are investigating aesthetic experiences and probing the reasons why art matters. The World Health Organization commissions large-scale studies on the value of the arts. Emmeline Edwards at the National Institutes of Health is beginning to fund research in the arts and Sunil Iyengar of the National Endowment of the Arts is supporting scientific research labs. Weaving these threads together are ideas that nature can be restorative and the arts can be transformative.

Cultural movements, hard to define and lacking clear boundaries, are typically labeled in retrospect. At the risk of making a premature claim, I offer that we may be witnessing a new Romantic resistance to a current disenchantment. Once again, art, aesthetics, and nature might be critical ingredients for countering this modern malady.



FINANCIAL SUPPORT

We aim to harness neuroscience to advocate for the vital importance of aesthetics in our lives. Moving through uncharted scientific territory is challenging given that traditional funding sources are cautious in their research programs. Philanthropic gifts are critical to realizing our vision.

Anjan Chatterjee was awarded a 2-year grant from the **National Endowment of the Arts** titled, **Measuring the Impacts of the Arts**. This project aims to create culturally diverse and inclusive resources for aesthetics researchers, including a training tool to enhance art engagement. We will test the efficacy of these tools to enhance appreciation for public art and its surrounding neighborhoods.

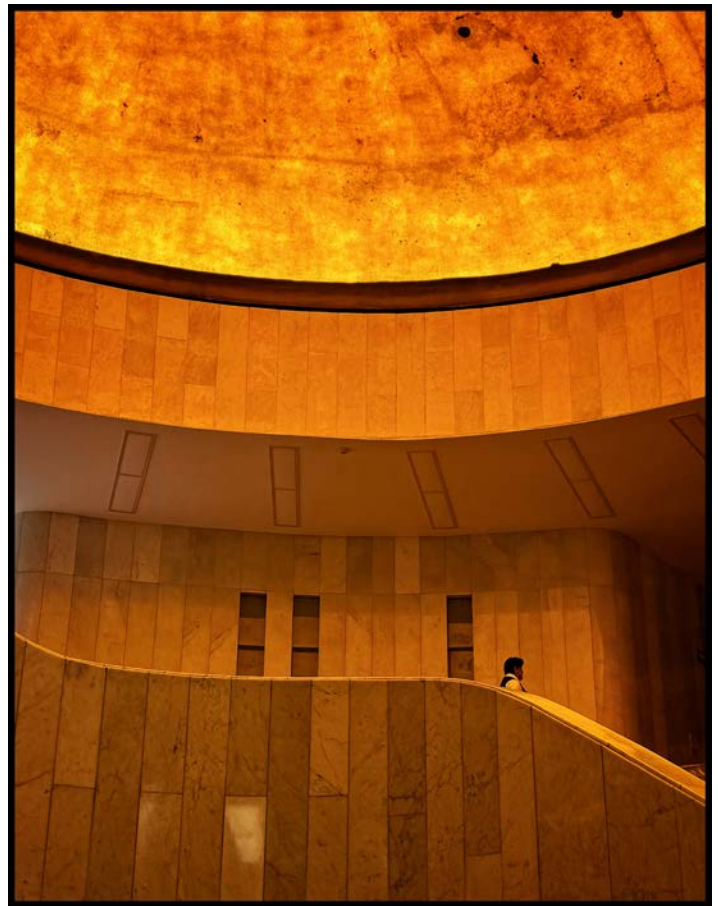
PCfN researchers continue to investigate the conditions under which art encourages new understanding as part of a 3-year grant awarded to Anjan Chatterjee from the **Templeton Religion Trust** titled, **Art Seeks Understanding**. We are now exploring the neural bases of responses to art as it relates to the possibility of transformation.

Follow-up research related to Anjan Chatterjee's award to conduct a pilot study jointly with the National Intrepid Center for Excellence (NICoE) and Creative Forces at the Walter Reed Military Medical Center continues. This line of work, titled **Art Therapy and Emotional Wellbeing in Military Populations with Posttraumatic Stress Disorder (PTSD)**, is funded by the Henry M. Jackson Foundation and the National Endowment for the Arts.

A new grant to Jeffrey Vadala and Anjan Chatterjee, the inaugural **Renée Fleming NeuroArts Award** to explore the use of virtual reality in neuroarchitecture research.

We appreciate generous support from:

- Mr. Matteo Scolari through the Scolari Family Fund
- Mr. Paul Zoidis through the Zoidis Family Trust
- Mr. Sean Smith through the ALPAS fund



All images provided by Anjan Chatterjee

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