



JACOBS SCHOOL OF MUSIC
INDIANA UNIVERSITY
Bloomington
__th Program of the 2023–24 Season

GUEST LECTURE-RECITAL

A Celebration of Mathematics and Music

Eugenia Cheng

Piano

with

Michelle DeYoung

Mezzo-Soprano



Sponsored by
the Department of Mathematics (College of Arts and Sciences)
and
the Department of Music Theory (Jacobs School of Music)

Ford-Crawford Hall
Tuesday Evening
February Twentieth
Seven O'Clock

“Mathematical Secrets of Music”

Math and music are often said to be related, but does this go any deeper than the fact that they both involve counting? In this lively hybrid talk and concert, mathematician and pianist Eugenia Cheng uncovers mathematical structures in some of her favorite pieces of music. The music, for which Dr. Cheng will be joined by mezzo-soprano and IU faculty member Michelle DeYoung, will be interspersed with discussion of a wide range of mathematical concepts in the music, including lowest common multiples, prime numbers, fractions, fractals, braids and more.



Johannes Brahms (1833–1897)
Die Mainacht, Op. 43, No. 2 (1866)

Johann Sebastian Bach (1685–1750)
From *The Well-Tempered Clavier*, Book II (1740)
Prelude in G Minor, BWV 885

Robert Schumann (1810–1856)
From *Dichterliebe*, Op. 48 (1840)
No. 6. Im Rhein, im heiligen Strome

Gabriel Fauré (1845–1924)
Les Berceaux, Op. 23, No. 1 (1879)

Franz Schubert (1797–1828)
Ave Maria (Ellens Gesang III), Op. 52, No. 6, D. 839 (1825)

Maurice Ravel (1875–1937)
From *Don Quichotte à Dulcinée* (1932–33)
No. 1. Chanson romanesque
No. 2. Chanson épique

Claude Debussy (1862–1918)
From *Préludes*, Book II (1912–13)
No. 5. Bruyères

Gustav Mahler (1860–1911)
From *Rückert-Lieder* (1901–02)
No. 3. Ich bin der Welt abhanden gekommen



Dr. Eugenia Cheng is a mathematician, educator, author, public speaker, columnist, concert pianist, composer, and artist. She is Scientist In Residence at the School of the Art Institute of Chicago. She earned tenure in pure mathematics at the University of Sheffield (UK) and is now Honorary Visiting Fellow at City, University of London. She holds a PhD in pure mathematics from the University of Cambridge and taught previously at the Universities of Cambridge, Chicago, and Nice.

Alongside her research in category theory and undergraduate teaching, her aim is to rid the world of “math phobia.” Dr. Cheng was an early pioneer of math on YouTube and her videos have been viewed around 15 million times to date. Her first popular math book, *How to Bake Pi*, was published by Profile (UK)/Basic Books (US) in 2015 to widespread acclaim, including from the *New York Times*, *National Geographic*, and *Scientific American*, and she was interviewed around the world including on the BBC, NPR, and The Late Show with Stephen Colbert. Her next popular math book, *Beyond Infinity*, was published in 2017 and was shortlisted for the Royal Society Insight Investment Science Book Prize. *The Art of Logic* was published by Profile and Basic Books in 2018, and *x + y: A Mathematician’s Manifesto for Rethinking Gender* followed in 2020. *The Joy of Abstraction: A Exploration of Math, Category Theory, and Life* (Cambridge University Press) came out in 2022, and her latest book is *Is Math Real? How Simple Questions Lead Us to Mathematics’ Deepest Truths*, published by Profile and Basic Books in 2023.

Dr. Cheng also writes the “Everyday Math” column for the *Wall Street Journal*, and has completed mathematical art commissions for Hotel EMC2, 6018 North, the Lubeznik Center, and the Chicago Cultural Center. She is the founder of the Liederstube, an intimate oasis for art song based in Chicago. As a composer she has been commissioned by Grammy-nominated soprano Laura Strickling and is one of the composers for the Lynx Amplify series, setting work by autistic poets who are primarily non-speaking. Dr. Cheng has also written two children’s books, *Molly and the Mathematical Mysteries* and *Bake Infinite Pie with $x + y$* .



Mezzo-soprano **Michelle DeYoung** is in demand throughout the world, having appeared with the New York Philharmonic, Boston Symphony Orchestra, Chicago Symphony Orchestra, Cleveland Orchestra, San Francisco Symphony, Pittsburgh Symphony Orchestra, London Symphony Orchestra, BBC Symphony Orchestra, Vienna Philharmonic, and the Royal Concertgebouw Orchestra. She has also performed at the festivals of Ravinia, Tanglewood, Saito Kinen, Edinburgh, and Lucerne.

Equally at home on the opera stage, Ms. DeYoung has appeared with the Metropolitan Opera, Lyric Opera of Chicago, Teatro alla Scala, Bayreuth Festival, Berliner Staatsoper, Paris Opera, and Opera Australia. Her many roles include Fricka, Sieglinde and Waltraute in the *Ring* cycle, Kundry in *Parsifal*, Venus in *Tannhäuser*, Brangäne in *Tristan und Isolde*, Eboli in *Don Carlos*, Amneris in *Aida*, Santuzza in *Cavallaria Rusticana*, Ježibaba in *Rusalka*, Marguerite in *Le Damnation de Faust*, Dido in *Les Troyens*, Judith in *Bluebeard’s Castle*, and Jocaste in *Oedipus Rex*. She also created the role of the Shaman in Tan Dun’s *The First Emperor* at the Metropolitan Opera.

A multi-Grammy-award-winning recording artist, Ms. DeYoung's discography includes *Das Rheingold*, *Die Walküre*, and *Götterdämmerung* with Jaap van Zweden and the Hong Kong Philharmonic Orchestra; *Kindertotenlieder*, Mahler's Symphony No. 3, and *Das Klagende Lied* with Michael Tilson Thomas and the San Francisco Symphony; *Les Troyens* with Sir Colin Davis and the London Symphony Orchestra; and Mahler's Symphony No. 3 with the Chicago Symphony Orchestra and Bernard Haitink and also with the Pittsburgh Symphony and Manfred Honeck. Her most recent recording of Mahler's *Das Lied von der Erde* with the Shanghai Symphony Orchestra was released in July 2021.

DeYoung recently launched *Ensemble Charité*, an organization that aims to support various charities while also fostering young, emerging musicians through community performances of chamber concerts with seasoned professional musicians, conducted by Ms. DeYoung.