BEYOND Words
strategic communication

Unearth Science Festival

Interpretive Panels for the Chicago Botanic Garden

Meet the Masons:
Nature's Power Pollinators and Builders

Humans rely on apples, berries, and nuts for food. In turn, these plants depend upon pollinators like bees to survive.

Meet the Masons

Mason bees (*Megachilidae*) are so named because they use mud to mortar their nests. They are a group that includes about 600 different bee species,140 native to North America.

Flying Solo

Mason bees live and work alone. In early spring, females buzz from plant to plant transporting pollen on their underbellies. When they land, some of the collected pollen falls into the flower. Pollination success!

Mason bees visit a variety of flowering fruit and nut trees, so they are exceptional cross-pollinators. Just two or three can pollinate a whole tree!

Builder Bees

Nearly 85% of all bee species make nests in the ground. Not native mason bees. They build in cavities: hollow plant stems, woodpecker holes, and other natural and human-made tunnels.

Once the female mason bee has collected enough food, she lays an egg at the back of the hollow indentation and seals the entrance with mud. She continues until the entire cavity is full. She'll fill many such nests during her month or so of egg-laying.

Help Pollinators. Build Our Bee-and-Bee!

This art installation is a functional native mason bee residence! Help us build it to attract native mason bees. Gather reeds and other natural materials and add them "in the wings." Pro tip: This is a great spot for a bee selfie!

Help Plants. Put the "Bee" in Backyard!

Mason bees are easy to raise. They are gentle (almost never sting) so they make good neighbors. No protective gear is needed – just simple supplies, a network of tubes like those in our art installation. When placing your nest, think sturdy, warm, and dry, near spring-blossoming plants and trees and a mud source. A few feet off the ground, affixed to an east-or-south facing side of a building is prime real estate.

Don't worry. We'll still "bee" here this summer. Look for the BEE PROJECT at the Learning Campus, part of the *Bees & Beyond* exhibition.

SOURCES

https://civileats.com/2016/07/27/move-over-honey-bee-here-comes-the-mason-bee/

https://thehoneybeeconservancy.org/why-bees/mason-bees/

https://www.gardeners.com/how-to/about-mason-bees/8198.html

https://www.ecolandscaping.org/03/beneficialspollinators/attract-mason-bees-no-protective-gear-needed/

https://www.fs.fed.us/wildflowers/pollinators/pollinator-of-the-month/mason_bees.shtml

Fast Forward: The Genius of John Nash Ott

A flower blooms before your eyes. A seed germinates. A caterpillar metamorphoses into a butterfly in a matter of seconds.

Every time-lapse video you've ever seen has roots in the imagination of Winnetka, Illinois resident, John Nash Ott.

Natural Light

Photographer. Cinematographer. Botanist. Inventor. A former banker, Ott transformed his passion for photography into a career as a photobiologist.

He was fascinated by the relationship between light waves and plant growth. In a self-built greenhouse in his Hibbard Road backyard, Ott conducted experiments involving plants and light. He came to realize that plants do not flourish solely with artificial light. They, and he surmised, humans, too, required a full spectrum of light, like that from the sun.

His research led to the development of the first full-spectrum fluorescent tube, now known as the Ott bulb.

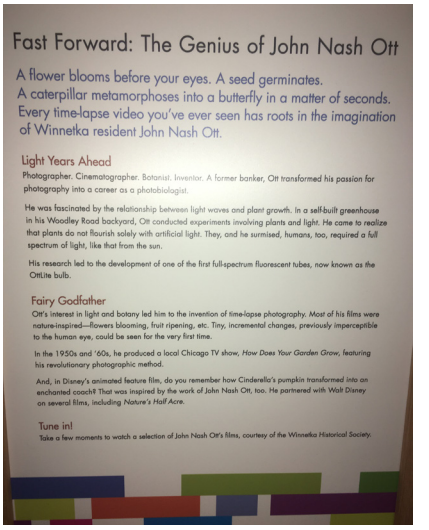
Fairy Godfather

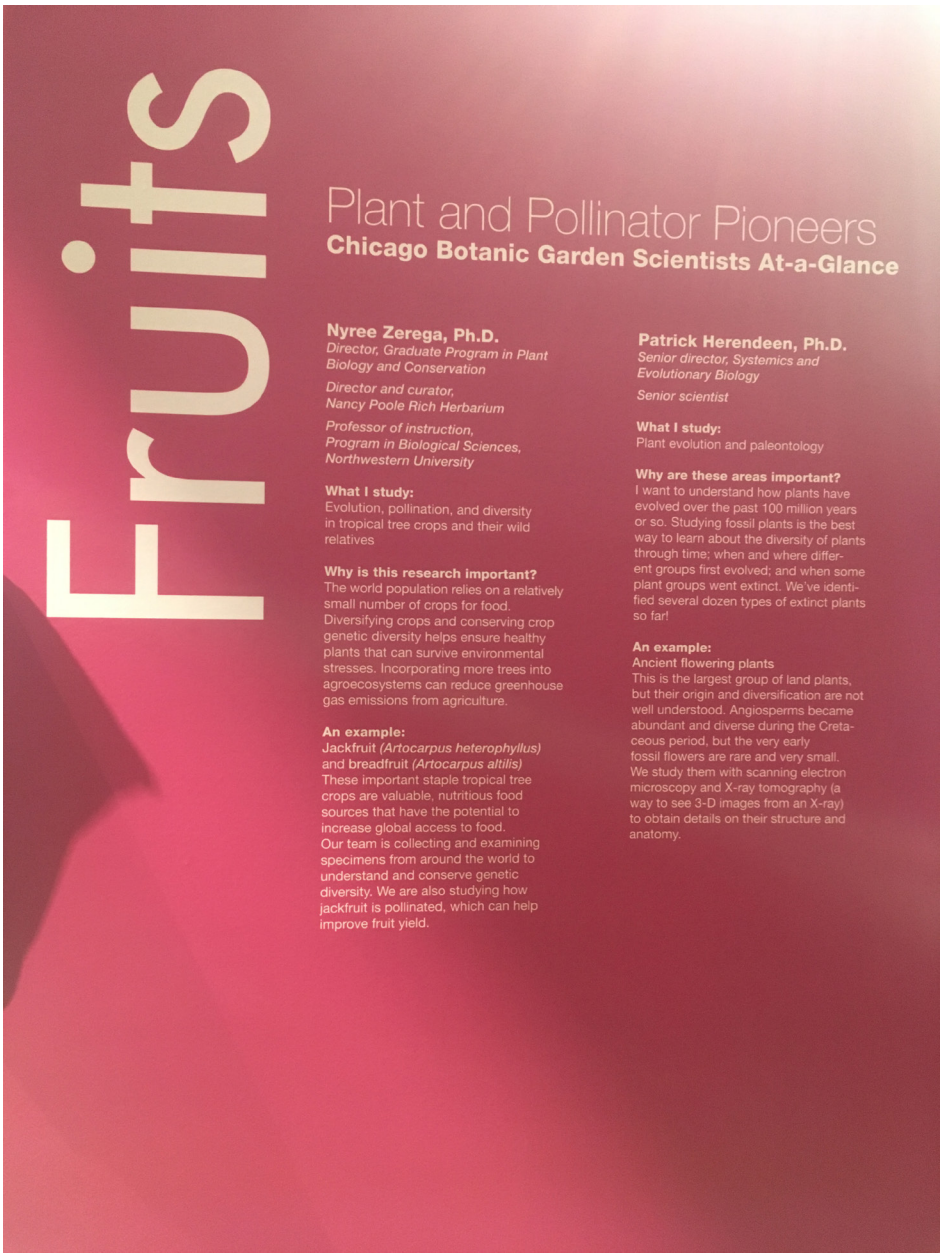
Ott's interest in light and botany led him to the invention time-lapse photography. Most of his films were nature-inspired—flowers blooming, fruit ripening, etc. Tiny, incremental changes, previously imperceptible to the human eye, could be seen for the very first time!

In the 1950s, he produced a local Chicago TV show, *How Does Your Garden Grow*, featuring his revolutionary photographic method.

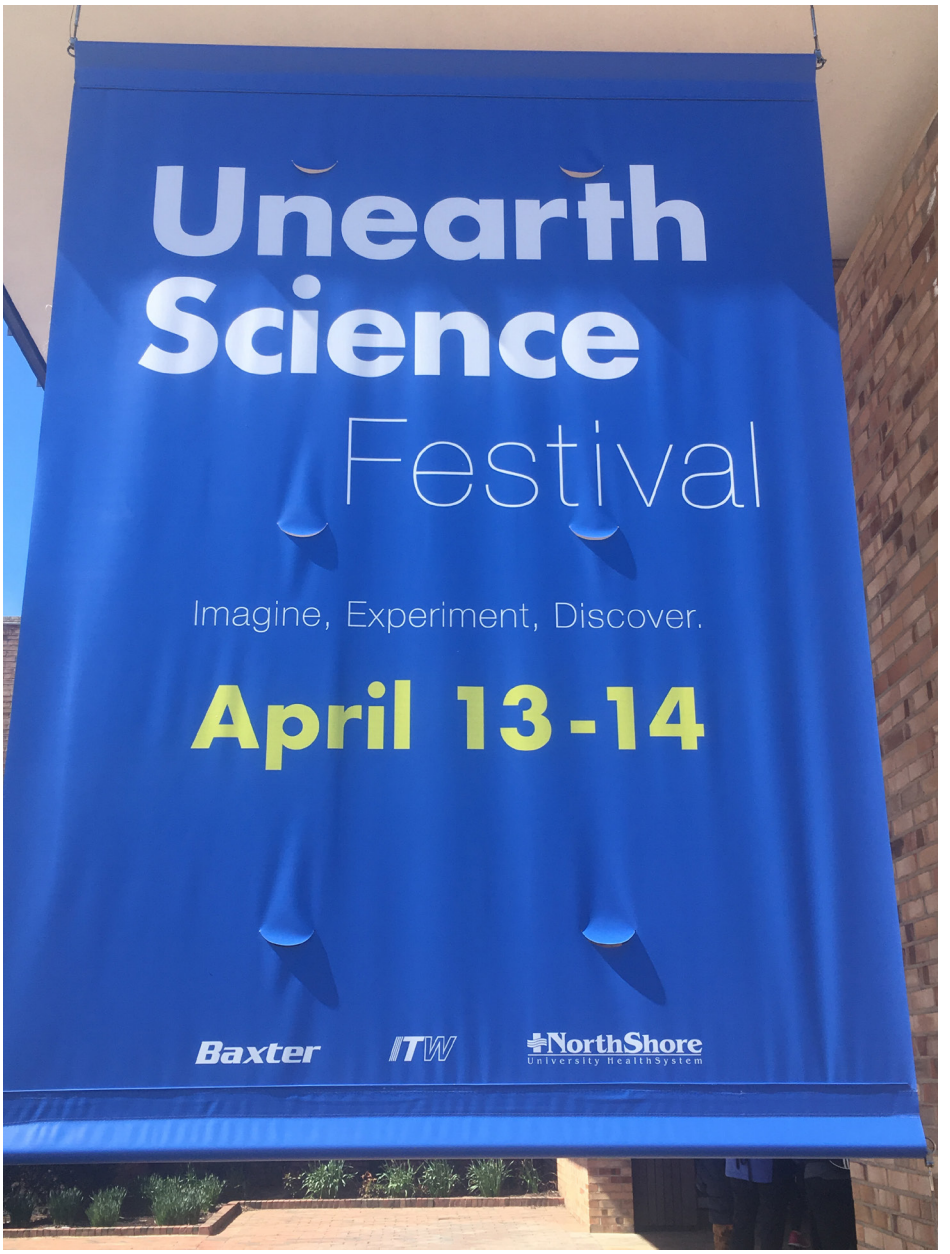
And, do you remember how Cinderella's pumpkin transformed into an enchanted coach? That was John Nash Ott, too. In fact, he partnered with Walt Disney on several films.

Tune in! Take a few moments to watch a selection of John Nash Ott's films, courtesy of xxxx.




Fruits
Plant and Pollinator Pioneers
Chicago Botanic Garden Scientists At-a-Glance
Nyree Zerega, Ph.D.
Director, Graduate Program in Plant Biology and Conservation
Director and curator, Nancy Poole Rich Herbarium
Professor of instruction, Program in Biological Sciences, Northwestern University
What I study:
Evolution, pollination, and diversity in tropical tree crops and their wild relatives
Why is this research important?
The world population relies on a relatively small number of crops for food. Diversifying crops and conserving crop genetic diversity helps ensure healthy plants that can survive environmental stresses. Incorporating more trees into agroecosystems can reduce greenhouse gas emissions from agriculture.
An example:
Jackfruit (Artocarpus heterophyllus) and breadfruit (Artocarpus altilis)
These important staple tropical tree crops are valuable, nutritious food sources that have the potential to increase global access to food. Our team is collecting and examining specimens from around the world to understand and conserve genetic diversity. We are also studying how jackfruit is pollinated, which can help improve fruit yield.
Patrick Herendeen, Ph.D.
Senior director, Systemics and Evolutionary Biology
Senior scientist
What I study:
Plant evolution and paleontology
Why are these areas important?
I want to understand how plants have evolved over the past 100 million years or so. Studying fossil plants is the best way to learn about the diversity of plants through time; when and where different groups first evolved; and when some plant groups went extinct. We've identified several dozen types of extinct plants so far!
An example:
Ancient flowering plants
This is the largest group of land plants, but their origin and diversification are not well understood. Angiosperms became abundant and diverse during the Cretaceous period, but the very early fossil flowers are rare and very small. We study them with scanning electron microscopy and X-ray tomography (a way to see 3-D images from an X-ray) to obtain details on their structure and anatomy.


Flowers
Plant and Pollinator Pioneers
Chicago Botanic Garden Scientists At-a-Glance
Stuart Wagenius, Ph.D.
Conservation scientist
What I study:
My team studies plants and insects that used to live in the vast grasslands, or prairies, of North America, but now their habitat is in small patches. We figure out what these plants and insects need to survive.
I help pollinators by:
Planting big experimental plots with lots of flowers. We investigate native bees that live in nests in the ground. We don't know if the bees need more flowers for food or more safe places for nests.
An example:
Purple coneflower
(Echinacea angustifolia)
Our 25-year study of this common native prairie plant in Minnesota has shown that controlled spring fires are critical to make plants flower to make more food for bees. We think the fires improve nest sites for the bees too, but we are still investigating.
Krissa Skogen, Ph.D.
Conservation scientist
What I study:
Pollinator ecology and plant reproductive biology. I'm interested in how plants, pollinators, and antagonists interact, and how they've shaped the great diversity of flowering plants we see today.
I help pollinators by:
Understanding the plant traits that attract floral friends (pollinators) and enemies (antagonists). I also investigate the impacts of human-caused factors on plants and their pollinators.
An example:
Harmgton's Evening primrose
(Oenothera harringtonii)
Some populations of this species produce a scent compound called linalool (think Froot Loops!), while others do not. Plants use scent to attract pollinators (here, hawkmoths), but sometimes that same scent lures antagonists (seed-eating caterpillars). How do plants avoid being eaten? We suspect that, in some populations, plants avoid advertising their scent to keep predators at bay.


Unearth
Science
Festival
Imagine, Experiment, Discover.
April 13-14
Baxter
ITW
NorthShore
University HealthSystem