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NEWS
from the world's largest scientfic society

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FOR IMMEDIATE RELEASE

Yes, Virginia, some snowflakes *can* look the same!

Snowflakes are one of the most recognizable and endearing symbols of winter. Their intricate shapes have been the inspiration for Christmas ornaments, jewelry and U.S. postage stamps. They are the subject of song, school projects and even scientific investigation, including a possible impact on global warming.

Jon Nelson, a researcher with Ritsumeikan University in Japan, has studied snowflakes for 15 years, and has some interesting insights into their delicate structures.

Is it true that no two snowflakes are alike?

The old adage that 'no two snowflakes are alike' may ring true for larger snowflakes, but it might not hold true for smaller, simpler crystals that fall before they've had a chance to fully develop. Regardless, snow crystals have tremendous diversity, partly due to their very high sensitivity to tiny temperature changes as they fall through the clouds.

How do snowflakes form?

A snowflake starts as a dust grain floating in a cloud. Water vapor in the air sticks to the dust grain and the resulting droplet turns directly into ice. And that's where the science kicks in.

First, the tiny ice crystal becomes hexagonal (six-sided). This shape originates from the chemistry of the water molecule, which consists of two hydrogen atoms bonded to an oxygen atom. Because of the angle of the water molecule and its hydrogen-bonding, the water molecules in a snowflake chemically bond to each other to form the six-sided flake. The flake eventually sprouts six tiny branches. Each of these branches grows to form side branches in a direction and shape that are influenced by the clustering of water molecules on the ice crystal surfaces.

– more –

CLICK HERE TO VIEW ILLUSTRATION ABOUT HOW SNOWFLAKES ARE FORMED:
http://acswebcontent.acs.org/journalist_resources/snowposter.pdf

Why are scientists interested in the study of snowflakes?

The study of snowflakes, which are really ice crystals, has recently become important due to the possible influences that these crystals have on global climate change. Researchers now believe that ice crystals play a crucial role in ozone depletion, possibly by acting as a catalyst to break down ozone. Ice crystals in the atmosphere also play a key role in building up electric charges in clouds and are therefore believed to influence the production of lightning, although the mechanism is unclear.

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Jon Nelson has written several research papers on snowflakes, including one in the American Chemical Society journal, "Crystal Growth & Design." That paper, published in 2005, helped explain several previously unanswered phenomena about snowflakes.

The American Chemical Society – the world's largest scientific society – is a nonprofit organization chartered by the U.S. Congress and a global leader in providing access to chemistry-related research through its multiple databases, peer-reviewed journals and scientific conferences. Its main offices are in Washington, D.C., and Columbus, Ohio.

EDITOR'S NOTE: The American Chemical Society's "**WonderNet**" Web site has a step-by-step hands-on activity for children to make their own snowflakes.
http://www.chemistry.org/portal/a/c/s/1/wondernetdisplay.html?DOC=wondernet%5Cactivities%5Ccrystals%5Csnowflakes.html

‘Branch Growth and Sidebranching in Snow Crystals’; Crystal Growth & Design; cg049685v.

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SUMMARY:
Snowflakes, one of the most recognizable and endearing symbols of winter, reveal some fascinating lessons about chemistry and science in general, according to a scientist at Ritsumeikan University in Japan. In an interview with the American Chemical Society, the researcher discusses how snowflakes form, why scientists are interested in studying them, and explains why the adage that ‘no two snowflakes are alike’ may not ring true in all cases.

KEYWORDS:
Chemistry/Physics/Materials Sciences; Atmospheric Science; Climate; Weather/Storms;