

A Field Guide to Falling Snow

(from SnowCrystals.com)

Although no two snowflakes are exactly alike, snow crystal forms usually fall into several broad categories. These are useful for defining a common language to describe snow crystals. You can find a more descriptive guide in our new book – *The Snowflake: Winter's Secret Beauty*.

Stellar Dendrites

Dendrite means "tree-like", which describes the multi-branched appearance of these snow crystals. Stellar dendrites have six symmetrical main branches and a large number of randomly placed sidebranches. They can also be large, perhaps 5mm in diameter.

Although they have complex shapes, each stellar dendrite is a single crystal of ice. The molecular ordering of the water molecules is the same from one side of the crystal to the other.



Sectored Plates

What identifies these crystals are the numerous ice ridges that seem to divide the plate-like arms into sectors -- hence the name. Like the stellar dendrites, sectored plates are flat, thin slivers of ice that grow into in a stunning diversity of complex shapes.



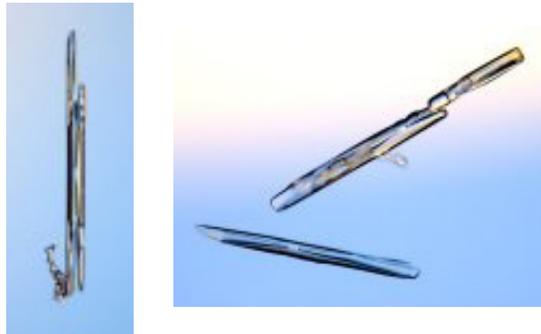
Hollow Columns

Plate-like snow crystals get the most attention, but columnar crystals are the main constituents of many snowfalls. The columns are hexagonal, like a wooden pencil, and they often form with conical hollow features in their ends.



Needles

Columnar crystals can grow so long and thin that they look like ice needles. Sometimes the needles contain thin hollow regions, and sometimes the ends split into additional needle branches.



Spatial Dendrites

Not all snowflakes form as thin flat plates or slender columns. Spatial dendrites are made from many individual ice crystals jumbled together. Each branch is like one arm of a stellar crystal, but the different branches are oriented randomly.



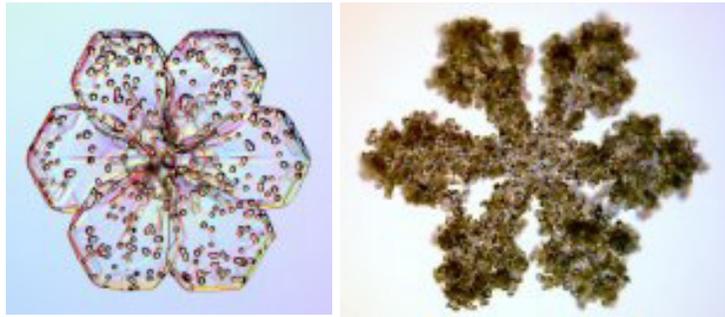
Capped Columns

These crystals started out growing as columns, but then suddenly switched to plate-like growth. This happens when a crystal is blown into a region with a different temperature.



Rimed Crystals

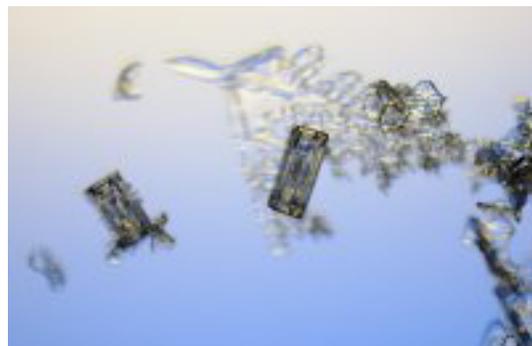
Snowflakes grow up in clouds, and clouds are made of small water droplets. Droplets that freeze onto a snow crystal are called *rime*, and these pictures show crystals that picked up a little rime and a lot of rime. Sometimes a snowflake turns into just a ball of rime, which is then called *graupel*, or soft hail.



Irregulars

Snowflakes can have a hard life blowing about in a turbulent cloud, so that many arrive on the ground broken, ill-formed, and generally in bad shape. Warm snowfalls tend to bring the most irregular snowflakes, especially when the wind is blowing hard.

The pictures above were taken by Patricia Rasmussen using a special snowflake microscope built by Kenneth Libbrecht. For more information, see snowcrystals.com.



	CODE	GRAPHIC SYMBOL	TYPICAL FORMS				TERM
Type of particle (F)	1						Plates
	2						Stellar crystals
	3						Columns
	4						Needles
	5						Spatial dendrites
	6						Capped columns
	7						Irregular particles
	8						Graupel (soft hail)
	9						Ice pellets (Am. sleet)
	0						Hail
Additional characteristics	<i>m</i>	*					Broken
	<i>r</i>	*					Rimed
	<i>f</i>	(*)					Flake
	<i>w</i>	*					Wet
Size of particle (D)	<i>a</i>	0-0.49 mm					Very small
	<i>b</i>	0.5-0.99 mm					Small
	<i>c</i>	1.0-1.99 mm					Medium
	<i>d</i>	2.0-3.99 mm					Large
	<i>e</i>	4.0 mm or larger					Very large

The above classification system provides a shorthand notation for describing falling snow. A large stellar crystal would be **2fe**. A medium-sized rimed plate would be written **1rc**.

The more detailed classification scheme below is by Magono and Lee.

	N1a Elementary needle		C1f Hollow column		P2b Stellar crystal with sectorlike ends
	N1b Bundle of elementary needles		C1g Solid thick plate		P2c Dendritic crystal with plates of ends
	N1c Elementary sheath		C1h Thick plate of skeleton form		P2d Dendritic crystal with sectorlike ends
	N1d Bundle of elementary sheaths		C1i Scroll		P2e Plate with simple extensions
	N1e Long solid needle		C2a Combination of bullets		P2f Plate with sectorlike extensions
	N2a Combination of needles		C2b Combination of columns		P2g Plate with dendritic extensions
	N2b Combination of sheaths		P1a Hexagon plate		P3a Two branched crystal
	N2c Combination of long solid columns		P1b Crystal with sectorlike branches		P3b Three-branched crystal
	C1a Pyramid		P1c Crystal with broad branches		P3c Four-branched crystal
	C1b Cup		P1d Stellar crystal		P4a Broad branch crystal with 12 branches
	C1c Solid bullet		P1e Ordinary dendritic crystal		P4b Dendritic crystal with 12 branches
	C1d Hollow bullet		P1f Ferrilike crystal		P5 Malformed crystal
	C1e Solid column		P2a Stellar crystal with plates at ends		P6a Plate with spatial plates

	P6b Plate with spatial dendrites		CP3d Plate with scrolls at ends		R3c Groupelike snow with nonrimed extensions
	P6c Stellar crystal with spatial dendrites		S1 Side planes		R4a Hexagonal groupel
	P6d Stellar crystal with spatial dendrites		S2 Scalelike side planes		R4b Lump groupel
	P7a Radiating assemblage of plates		S3 Combination of side planes, bullets, and columns		R4c Conellike groupel
	P7b Radiating assemblage of dendrites		R1a Rimmed needle crystal		I1 Ice particle
	CP1a Column with plates		R1b Rimmed columnar crystal		I2 Rimmed particle
	CP1b Column with dendrites		R1c Rimmed plate or sector		I3a Broken branch
	CP1c Multiple capped column		R1d Rimmed stellar crystal		I3b Rimmed broken branch
	CP2a Bullet with plates		R2a Densely rimmed plate or sector		I4 Miscellaneous
	CP2b Bullet with dendrites		R2b Densely rimmed stellar crystal		G1 Minute column
	CP3a Stellar crystal with needles		R2c Stellar crystal with rimmed spatial branches		G2 Germ of skeletal form
	CP3b Stellar crystal with columns		R3a Groupelike snow of hexagonal types		G3 Minute hexagonal plate
	CP3c Stellar crystal with scrolls at ends		R3b Groupelike snow of lump type		G4 Minute stellar crystal
					G5 Minute assemblage of plates
					G6 Irregular germ