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Ice in the Earth's atmosphere

"Let there be light," and there was light.*

The fact that the Earth's sky appears blue is a consequence of the scattering of "light" by molecules according to the theory of Rayleigh scattering. The fascinating halos and arcs we see mixed within blue sky result from light scattering by ice crystals.

Our presentation of light scattering by ice crystals begins with an overview of clouds. This is followed by a global view of ice distribution in the Earth's atmosphere; formation and growth of ice crystals; ice crystal morphology, size, and distribution; and a discussion of cirrus cloud modeling with a linkage to some of these topics.

1.1 Introduction to clouds

I BRING fresh showers for the thirsting flowers,
From the seas and the streams;
I bear light shade for the leaves when laid
In their noonday dreams.
From my wings are shaken the dews that waken
The sweet buds every one,
When rocked to rest on their mother's breast,
As she dances about the sun.
I wield the flail of the lashing hail,
And whiten the green plains under,
And then again I dissolve it in rain,
And laugh as I pass in thunder.
...
I am the daughter of Earth and Water,
And the nursling of the Sky;
I pass through the pores of the ocean and shores;
I change, but I cannot die.
For after the rain, when with never a stain

* A quotation from Genesis 1:3 to the extent to introduce the term, "Let there be light."