The relatively small number of plants infected by CCMV in this experiment could add up to a lot of plants in the crop world, notes Gustaaf A. de Zoeten, also of Michigan State. It suggests that researchers "need to preemptively do risk assessments" of the likelihood of different agents recombining, he says.

But Bryce W. Falk and George Bruening of the University of California, Davis, argue in an article in the same issue of SCIENCE that virus recombination poses little risk. Plant viruses have always had opportunities to interact genetically, they point out.

"Whatever interactions occur in mixed infections rarely result in new pathogenic viruses," they assert. Pathogens in genetically altered and normal plants will recombine at a similar rate, they believe. Nor do they expect the new viruses to be any more viable than existing ones.

But the rate "at which recombinants occur will be enhanced in virus-resistant transgenic plants," Allison speculates. For recombination to occur, the viruses must reside in the same cell at the same time. This is more likely in the transgenic, or genetically modified, plant, he asserts.

Allison and his colleagues are trying to develop virus-resistant plants that will not produce new pathogens through recombination. "I'm not against virus-resistant transgenic plants," he adds.

– T. Adler

A brighter future for silicon aerocrystals

What would it be like to hold in one's hand a solid, crystalline object composed almost entirely of empty space – a material so sparse in structure that it appears nearly as faint as the air itself?

Such wispy, ethereal masses – almost like a solid, translucent version of beer foam – do exist. Since their appearance in 1931, these aerogels have intrigued scientists, who search for efficient ways to make and use them in a wide variety of electronic and optical applications.

Now, Leigh T. Canham, a physicist at the Defense Research Agency in Malvern, England, and his colleagues report a new method of drying that improves the production and quality of an aerogel relative made of highly porous silicon. Known as silicon aerocrystals, these materials have garnered much interest in the world of computers and electronic communications because of their ability to give off light. With their 95 percent porous structure, such crystals exhibit "strong photoluminesence," making them potentially useful as thin films for optical-electronic devices.

The chemists describe their results in the March 10 NATURE.

When a wet, porous material dries by evaporation, the changeover of the liquid to a vapor can cause stresses and strains that "induce cracking, shrinkage, and even complete disintegration of delicate solid skeletons," says Canham. "Think of the way a riverbed cracks as it dries," he explains.

Using supercritical drying – in which carbon dioxide gas is warmed to 40 °C and pressurized to 100 atmospheres – the scientists can remove liquid from the material's pores and avoid the fractural contractions that ordinarily accompany drying.

Compared to silicon aerocrystals dried by evaporation, which showed heavy cracking, the specially dried crystals revealed no cracks when examined with electron microscopes, both scanning tunneling and scanning transmission, Canham and his colleagues report.

While this kind of drying has come into wide use in preparing biological and ceramic materials, it has only now proved useful for making highly porous silicon. Moreover, the supercritically dried aerocrystals showed that they could generate light more efficiently than similar crystals dried by evaporation, the researchers say.

The reason, they contend, lies in the fact that smaller crystal "skeletons" survive the drying process.

Supercritical drying, they add, makes possible efficiencies that "would not otherwise be achievable."

– R. Lipkin

Clementine begins moon-mapping mission

The day before beginning a 2-month survey of the moon, the Clementine spacecraft trained its four cameras on a north polar region of the lunar surface that includes part of a 100-kilometer-wide crater called Nansen. These images, released last week at a Pentagon press briefing, show a section of the crater and its surroundings. Nansen, which lies on the limb of the moon, appears as a shadowy form in the lower left of the UV/visible and near-infrared pictures.

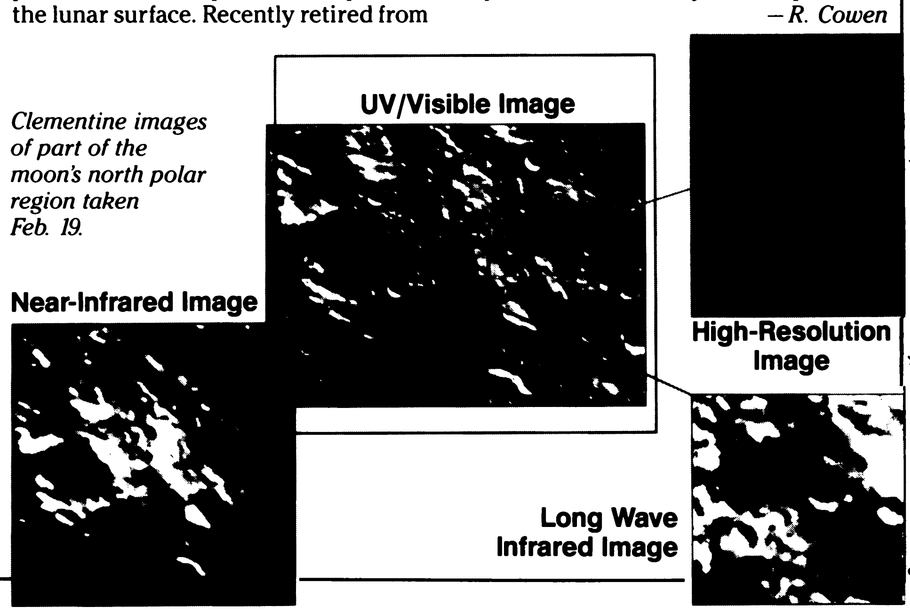
This multiwavelength portrait offers a prelude to the high-resolution map Clementine is expected to generate during its lunar sojourn. The first spacecraft to orbit the moon in 23 years, Clementine will map the entire lunar surface from a polar orbit. In contrast, previous U.S. missions mapped only the moon's equatorial regions.

A joint mission of NASA and the Ballistic Missile Defense Organization (the former Star Wars office), Clementine will test several detectors for the military in a mission expected to include the first flyby of a near-Earth asteroid (SN: 1/15/94, p.40). Though it will use all four of its miniature cameras to image the moon, two of them – the near-infrared and UV/visible devices – will play the major role. These cameras will map the moon's surface at 11 wavelengths, resolving features as small as 200 meters across.

The color map, notes geologist Eugene M. Shoemaker, will help identify the composition of lunar rocks and provide new clues to the geological processes that shaped various parts of the lunar surface. Recently retired from the U.S. Geological Survey in Flagstaff, Ariz., he is helping to analyze the lunar images, some 40,000 of which had been generated as of March 1.

Shoemaker notes that cameras on the Apollo missions examined at high resolution both the front side of the moon and a narrow swath of the back. "But the images we're taking now are going to cover the entire moon. We'll get a global data set of very high photometric fidelity. . . . That's a totally new step."

– R. Cowen



Clementine images of part of the moon's north polar region taken Feb. 19.

NASA, Naval Research Laboratory, Ballistic Missile Defense Org.