fancy these!

inside the diamond rainbow

Saucy Aussie Hues • Techni-Colors • Singing the Blues

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inside the diamond color rainbow

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editor-in-chief
Diamonds come in all 13 colors recognized by the National Institute of Standards. And this doesn’t include the 14th category: colorless. Together these colors comprise a great wheel, or globe. Let’s do some globe trotting and visit each of the NIS’s distinct color categories.

OPPOSITE PAGE: A selection of fancy colored diamonds. Photos courtesy of Aurora Gems. THIS PAGE, CLOCKWISE FROM TOP LEFT: Multi-colored diamond rings by Mondial Neuman Jewelers; yellow diamond bracelet by Canary Star; brown diamond earrings by Interjewel; green diamond brooch by Sethi Couture; multi-colored diamond ring by Hans D. Krieger Fine Jewelry; black diamond ring by Rahaminov Diamonds; multi-colored diamond rings by Distarco Corporation; intense yellow diamond ring by Rachminov Diamonds 1891; brown diamond earring by Sethi Couture. Photos courtesy of NCDIA.
Thousands of gemologists around the world earn their living by grading colorless diamonds. But it is doubtful that there are more than a few dozen who are paid in whole or part to grade colored diamonds.

This has far less to do with the rarity of fancy-color diamonds relative to colorless ones than with the difficulty of grading such stones. Colorless or near colorless stones have a relatively straightforward grading system, developed by GIA 56 years ago.

This scale is one-dimensional, broken into 23 intervals, with stones assigned a letter rating based on their appearance in the color-squenching face-down position relative to pre-graded comparison diamonds called “master stones.” Due to the preponderance of “off-color” stones, the D-to-Z GIA color grading system accommodates diamonds with a light yellow or brown tint.

“Virtually all other colors are grouped into a broad classification referred to as ‘fancy color diamonds’,” says Christopher Smith, president of American Gemological Laboratories, New York. “Yellow and brown diamonds only enter this realm when their color is considerably stronger.” Stones assigned a rating in the lower depths of the GIA scale are called “cape” — a reference to South Africa’s Cape of Good Hope and the discovery of very often yellowish diamonds in that country around 1869. Although the D-to-Z ranking process is tricky, its practice can be, and has been, taught to tens of thousands of gemologists with considerable success and proficiency.

FROM CAPE TO FANCY

Now turn that same conspicuously tinted cape stone over into the face-up position where it effuses color through the crown and grade it for the presence, rather than the absence, of color.

In an instant, color grading is a whole new ball game. Many factors can influence the way color appears in the face-up, as opposed to the face-down, position. When color is being judged in the face-up position, and we enter the realm of fancy color, the grader is asked to step off a cliff into a complex three-dimensional color space where stones must be rated for three attributes: color, tone, and saturation.

Suddenly, a stone has a multi-part rating — e.g., fancy light yellow. Hell, it might even be described as fancy grayish-yellow. Or maybe it's a brown stone from, say, Australia that merits a grade of fancy pinkish-brown. In the face-down position, checked against master stones, some of the lower-echelon cape stones may receive only a letter grade. But flip the same stone over into the face-up position and they become a fancy color whence new procedures apply.

No wonder so much money rides on these intricate
color descriptions. To get a firm beginner’s grip on fancy color diamond grading, I turned to two experts in this thinly populated field: Smith and Stephen Hofer of Fancy Color Consultants, East Otis, Massachusetts. Here is primer on colored diamond grading as these two seasoned gemologists practice it. I’ll try to make their fiendishly difficult task as easy to understand as possible. But, as they say on action TV shows, “Don’t try this at home.”

TREKKERS IN COLOR SPACE
Thankfully, gemologists who are grading diamonds for color are not star trekkers going where no man has gone before. They’re just going where few among their own profession have gone. Color space was thoroughly mapped decades ago.

Those who enter quantified color space are able to take readings and translate them into meaningful measurements that tell you the following: 1) the hue composition, 2) the tone (lightness or darkness) of the color, and 3) its freedom from modifiers (washout due to gray or brown).

To make these readings, Hofer and Smith use instrumentation. Hofer uses a colorimeter to make color plots using various color-mapping systems such as CIE. Smith prefers spectroscopy whose readings are correlated to accepted color-mapping systems. Armed with mathematical color readings, both men hone numbers into verbal descriptions using GIA grading language. This language crunches three measurements into a two-part color grade—the first part consisting of a combined tone and saturation judgments and the second a description of hue composition.

Let’s start with tone and saturation.

FROM LIGHT TO DARK, WEAK TO STRONG
Color isn’t just about hue. Color is also about strength of appearance. Color can be light or dark in tone, weak or strong in saturation. Hence judgments about intensity are as important as judgments about composition. Although scientific color measurements made with analytic instruments tend to quantify color in terms of three coordinates — hue, tone, and saturation — gem labs tend to grade colored diamonds for strength first and composition second.

Today, colored diamonds are rated using the GIA color grading system in its last formulation published in the 1990s. That system uses seven classifications: light, fancy light, fancy, fancy intense, fancy vivid, fancy deep, and fancy dark. While these seven grades represent a progression from light to dark and weak to strong, they do not translate into a progres-
blue

The world's most famous diamond, the 45.52-carat Hope, which resides at the Smithsonian Institution in Washington, D.C., is blue. GIA describes it as a fancy deep grayish-blue. Gray is common to most blue diamonds and gives them a slightly steely color. But some diamonds are pure blues. Don't get the wrong idea, though. A pure blue diamond will not resemble a Kashmir, Burmese or Sri Lankan sapphire. It won't call to mind a cobalt-blue spinel or royal violetish-blue tanzanite. Diamond blue is more masculine and rugged. However, greenish-blue diamonds, which are generally light and medium-toned, might easily remind one of aquamarine or beryl. Today, South Africa's Premier Mine is the main producer of big blues. Before 1725 and the discovery of diamonds in Brazil, India was the main, if not sole, source. Nearly all natural blue diamonds are Type Iib, meaning they are colored by the trace element boron. Other varieties of blue diamonds may exhibit an influence of a green or violet modifier.


green

While some diamonds are colored by chemical impurities such as boron or nitrogen, many owe their colors to structural damage at the atomic level which throws enough atoms out of alignment to influence color absorption and transmission. Often this damage is caused by the proximity to ancient irradiation and results in deep green colors. Therefore, classifying green diamonds as natural takes incredible gemological expertise. In many cases, green diamonds can also reveal nuances of blue or yellow. Over a decade ago, artificial irradiation was used to create a sudden influx of beautiful, never-before-seen pistachio- and avocado-green stones that were at first identified as natural until the hoax was uncovered.

left: A green diamond ring from Nice Diamonds. Photo courtesy of GICIA. below: Rough and polished green diamonds. Photos courtesy of Aurora Gems.
Many greenish diamonds contain too much yellow, gray, or brown to be considered truly or even basically green. These admixtures are more accurately and honestly described as olive and would be instinctively perceived as such by most observers. Yet because "olive" has a pejorative connotation to many in the trade, some labs such as GIA refuse to recognize this color-blend as a validly distinct color category. Rather than call diamonds olive, they fit them into various Procrustean terminological beds with awkward color combinations comprised of yellow, green, brown, and gray. Hofer and Smith call these diamonds what they are: olive. "The goal is to do as much to improve the reputation of olive diamonds as the trade has done to improve the reputation of brown ones," Hofer says.

Until Australia became the world's largest diamond producer in the mid 1980s, yellow, caused by the presence of nitrogen, was the most common tint in "colorless" jewelry diamonds and the most common shade of natural fancy color diamond. Afterwards, brown became just as common a tint as well as a fancy color shade. The first major South African diamond to be found, named the Eureka, was a fancy-color yellow stone. Although yellow diamonds can and do often bear visible traces of green, orange, and brown, pure breeds are common in a wide range of tones from pale to dark. A word of warning: many diamonds described as "canary" lack the infusion of orange that qualifies them for this descriptive term.

THIS COLUMN, FROM TOP TO BOTTOM: A yellow diamond ring by Martin Flyer (photo courtesy of NCDIA); a yellow diamond pendant from Martin Kirschbaum, Inc. (photo courtesy of NCDIA); a cut and polished yellow diamond (photo courtesy of Aurora Gems).
purple

For a short while back in the early 1990s, there was a tiny torrent of natural purple diamonds from Russia that remains one of the most memorable events in modern colored diamond history for this writer. There is simply nothing as haunting as a rhododendron-purple diamond. Ever since, I have seen strongly purplish diamonds but none like those that were very briefly a frequent sight in Antwerp.

RIGHT: A cut and polished purple diamond. Photo courtesy of Aurora Gems. ABOVE RIGHT: Purple diamond earrings from Gem Platinum. Photo courtesy of NCDIA. FAR RIGHT: Multi-colored diamond necklace by Zoltan David. Photo courtesy of NCDIA.

violet

Like a new planet in the solar system, violet is a new admission to the diamond color spectrum. Maybe that’s because all known violet diamonds are from Australia’s mammoth Argyle Mine which didn’t start producing in awesome earnest until around 1985. And even when its teeny number of violet diamonds finally started reaching the market in the 1990s, many gemologists were loath to recognize them as such. You see, violet diamonds are striking blends of violet, gray, and blue and can often be mistaken for blue diamonds — that is, until their uniquely haunting color sets them apart from other blues.

gray/black

There have always been slate and silver colored diamonds, but they were hardly ever considered fancy colors until recently. The intensity of color in these stones is a function of the degree to which they contain masses of highly particulate inclusions that impart flattering grays to them. Hofer reports the existence of stunning violetish-gray diamonds that reminded him of colors seen in the evening sky.

When a diamond is perceived as totally dark and colorless, it is described as black. But such stones aren’t necessarily coal or graphite colored. Some diamonds may be so densely green or deeply brown that they appear black. Because black diamonds are often polycrystalline masses rather than single crystals, or simply infested with inclusions, they are exceedingly difficult to cut. No wonder irradiated black diamonds have been so popular in recent years. Many natural black diamonds are too pitted, a sign of labor problems. That’s why we retain deep admiration for superbly well-shaped, smooth-surfaced natural black diamonds — and consider them bargains.

white

Some diamonds with large concentrations of light inclusions take on a milky appearance that qualifies them for classification as “white.” Imagine, if you will, moonstone or opal-like diamonds. Of all the diamond colors that have yet to attain popularity, white — not to be confused with colorless — has the most upward mobility.

THIS COLUMN, FROM TOP TO BOTTOM: A gray diamond pendant from Rachmilev Diamonds 1891 (photo courtesy of NCDIA); a group of diamonds showing the range from gray to black (photo courtesy of AGL); a polished black diamond (photo courtesy of Aurora Gems).

THIS COLUMN, TOP TO BOTTOM: A grouping of milky white diamonds (photo courtesy of GIA); two white- and yellow-diamond butterfly brooches (photo by Carlton Davis, courtesy of Tiffany & Co.).
Over the past quarter century, "brown" has been elevated from a pejorative to a neutral and increasingly positive color term. Credit for this attitude change belongs to Rio Tinto's Argyle Diamond Mines, the Australian company which set about improving the reputation of brown diamonds because the bulk of its production was this color. By introducing the romance-oriented marketing name of "champagne diamonds" and "cognac diamonds," the company performed a feat of cultural and esthetic engineering that is as great as any accomplished by De Beers.

Pure pumpkin and citrus orange diamonds are exceedingly rare and remain a popular and expensive quest-stone among collectors and connoisseurs. Most that we have seen are very small and deservedly expensive. Ironically, orange is a common secondary color in many brown and yellow stones. Strong orange-brown stones often have a color that the trade describes as "burnt" orange, an attractive autumnal color very popular in men's diamond jewelry.
red

If there is a grail-diamond, it would undoubtedly be pure red and so vivid as to evoke Burmese ruby or spinel. Alas, the only red diamonds that we have seen inviting such comparisons all owe their color to either or both irradiation and high-temperature-high-pressure color alteration in a lab. This isn’t to say that there aren’t natural color red diamonds, but most have a very visible purple component, deep in tone and remind more of, say, rubellite. Of all diamond color designations, this is the most controversial and frequently disputed. One thing for sure: don’t think, or even dare to hope for, Burma ruby-red when you think of natural-color red diamonds. To label a diamond as such would be, pardon the pun, purple prose.

RIGHT: A cut and polished red diamond. Photo courtesy of Aurora Gems.

pink

Technically speaking, pink is a pale, or desaturated, red. But truly speaking, it is its own distinct color category, clearly perceived as separate from red and thus deserving of its own color identity. No one would think of a bubble-gum or cherry-blossom pink as a pale red. They wouldn’t even think of an azalea purple-pink as a red. Yet diamonds occur with all these hues and are rightly classified as pink, often with modifiers of purple and, since the influx of Australian pinks on to the market, brown. None of them can be thought of as wannabes. Nevertheless, there is an area where diamonds seem redish and not pink. However, deciding the wavy cross-over point between the two is a problem.