

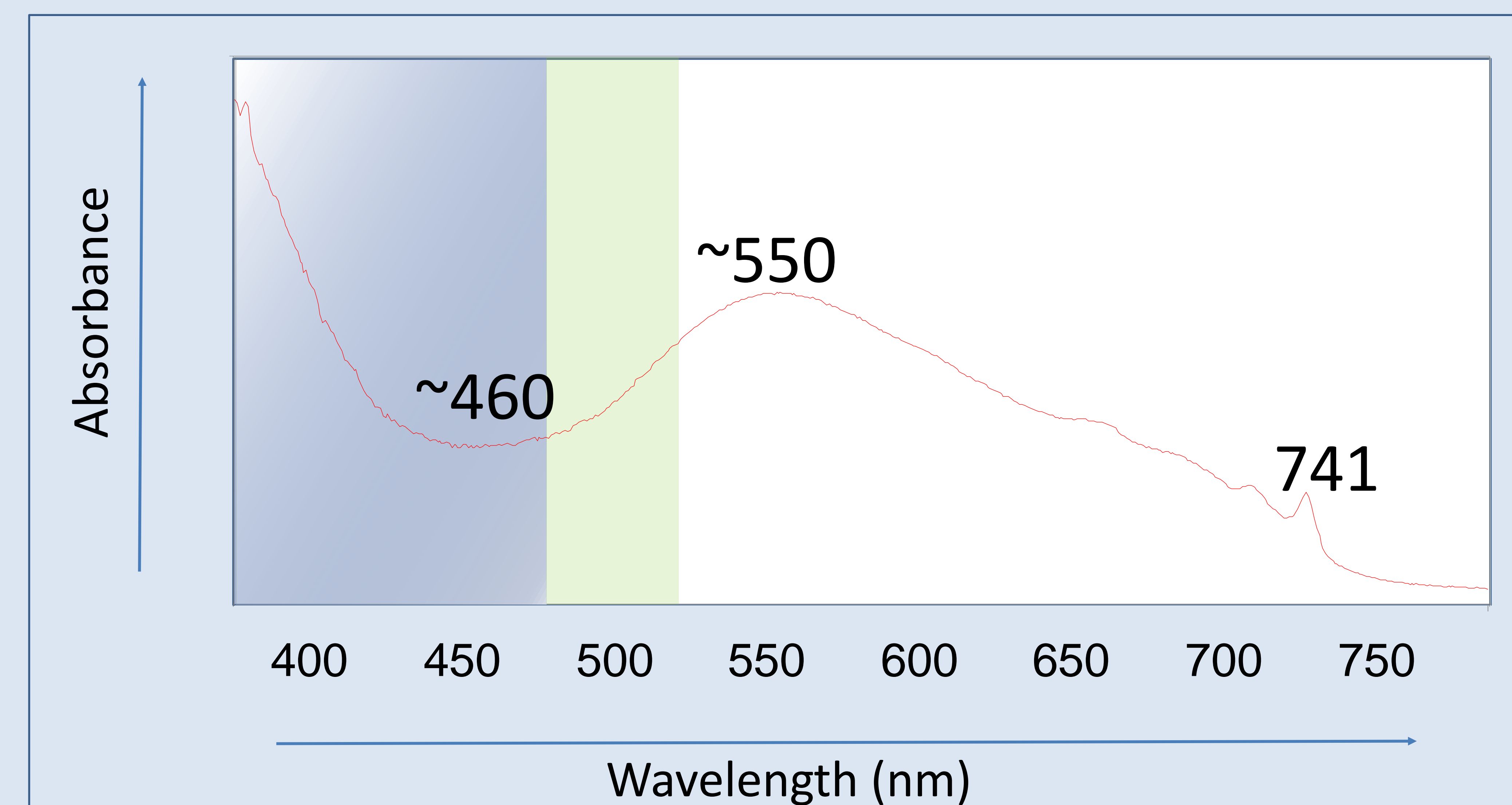


Blue is a very desirable color for diamond. A rare type of blue to violet diamond came from the recently closed Argyle mine in Australia. Two of the largest diamonds of this type to date are set in gold pictured above (2.34 ct emerald cut and 1.06 ct oval cut). Photo by Robert Weldon.

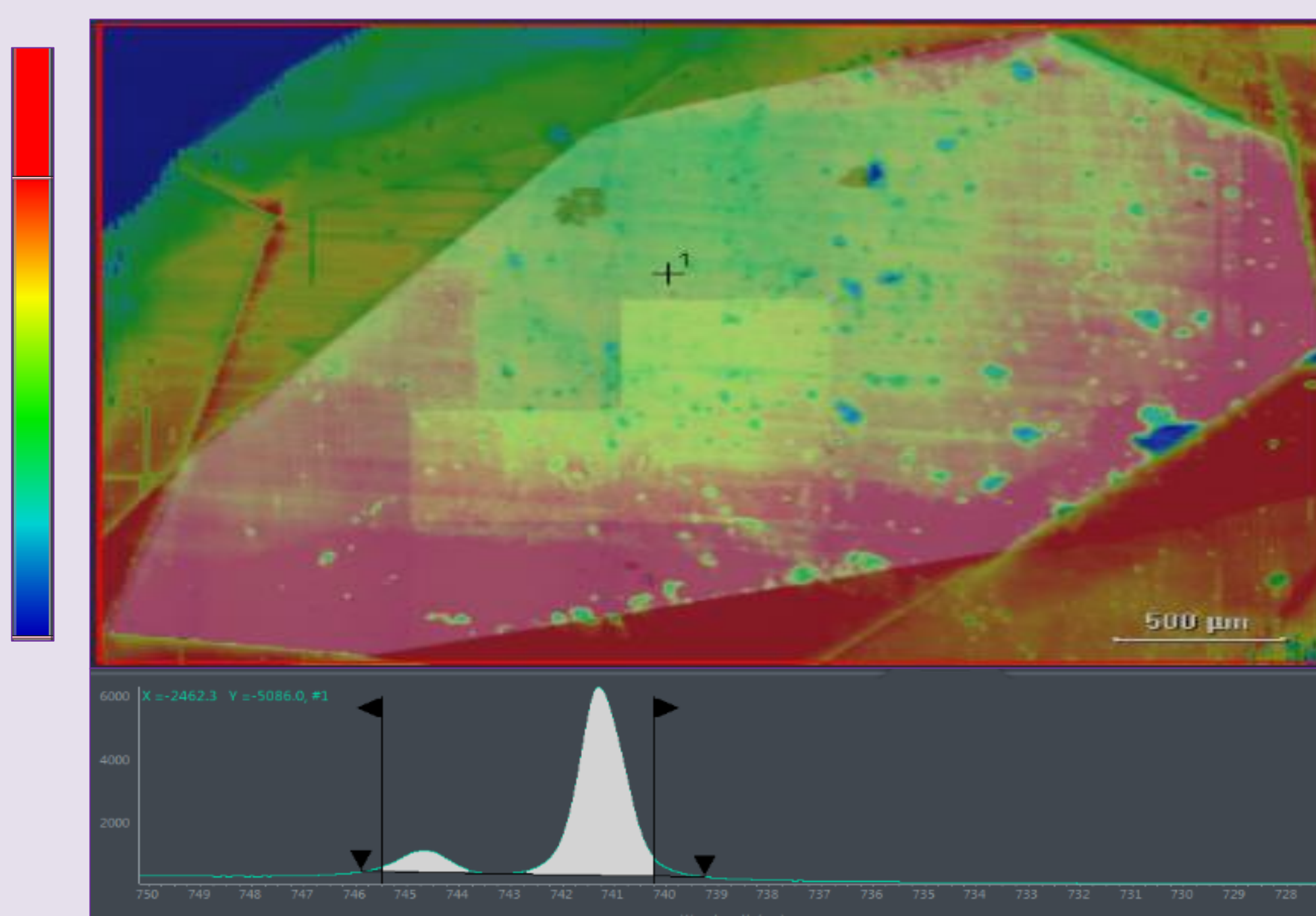
Gemological features typical of natural pink type Ia diamonds were observed under the microscope, including very strong graining or glide planes with a pink color. IR spectroscopy confirmed that this is a type Ia diamond. The unusual graining (haziness) contradicts the blue color of this diamond. A UV-visible absorption spectrum collected from this diamond showed a broad band at about 550 nm, typical for this type of diamond and the pink color attributed to it (resulting from plastic deformation of the crystal lattice during growth or post-growth). A GR1 (general radiation damage) peak at about 741 nm was also observed. This radiation damage is responsible for the green and blue colors observed in some diamonds, both naturally colored and treated.



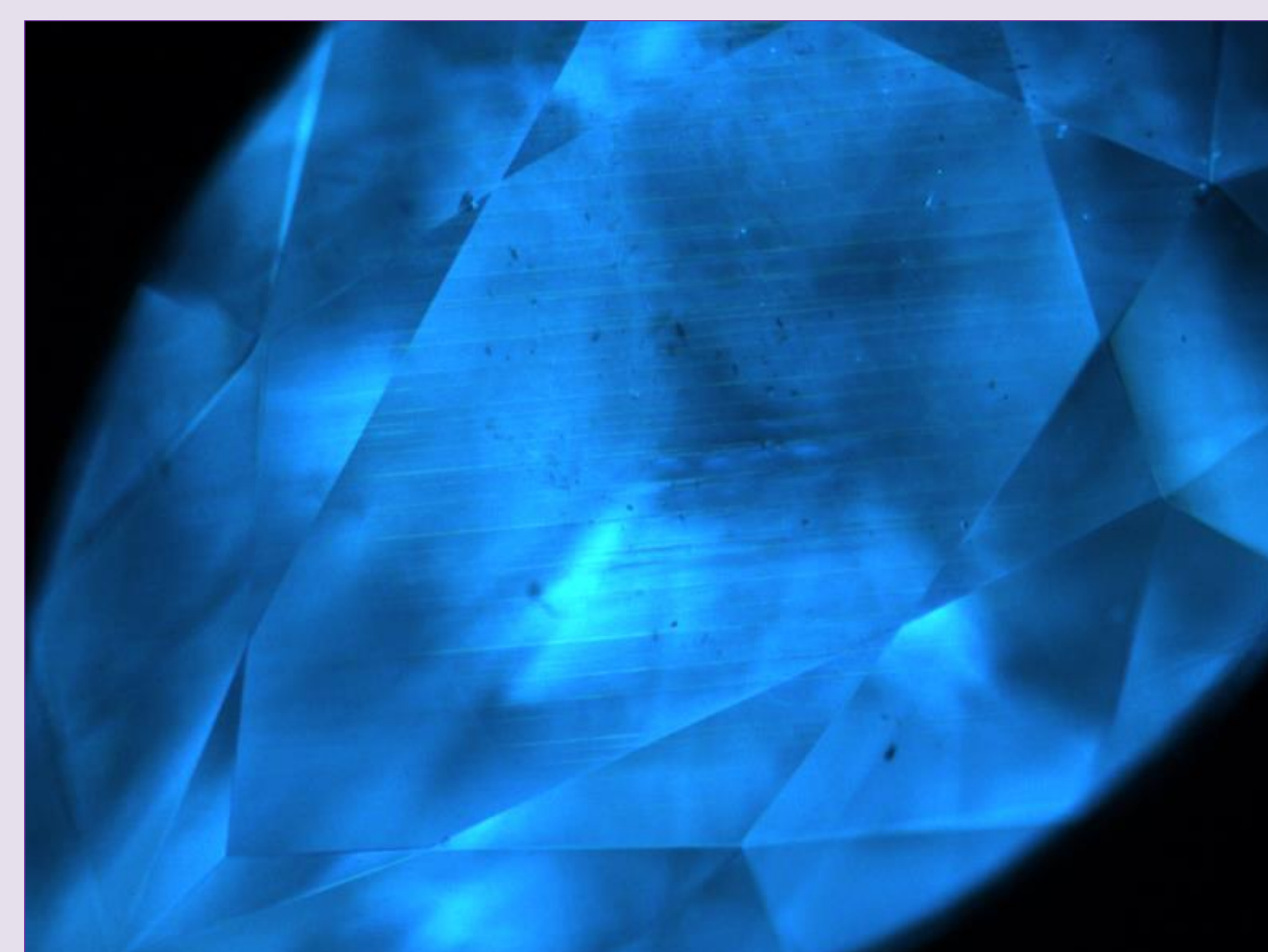
0.53 ct Fancy Light blue pear-shaped diamond. A GIA colorimeter image below right shows a more intense blue/purple color.



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When mapped with a Raman photoluminescence microscope, this GR1 radiation damage could be seen concentrated on one side of the diamond. This concentration of radiation damage, in conjunction with the absorption spectroscopy and gemological features, enabled the confident determination that this diamond had been artificially irradiated to create the desirable blue color.



Typical blue fluorescence was observed when viewed with the DeBeers Diamondview instrument™ (short wave UV radiation). Strong graining can also be seen (green lines H3 defect) typical for the Argyle type diamonds that have been subject to strong plastic deformation.



GIA records query search revealed that this diamond had a previous report with a Fancy Light pinkish purple color grade.



Other diamonds treated in this way have been identified some with an increase in intensity of color. Above is a 0.49 ct Fancy blue Pear cut diamond also concluded as treated color. Future will include trying to recreate this Irradiation treatment and color engineering.



References:
 "Gray-to-blue-to-violet hydrogen-rich diamonds from the Argyle mine, Australia," C.H. van der Bogert et al., *Spring 2009 G&G*, pp. 20–37
 "Irradiated Blue Diamond" Paul Johnson et al., Winter 2020 G&G, Vol. 56, No. 4
 (R. Crowningshield, "Developments and Highlights at GIA's Lab in New York," Fall 1969 G&G, pp. 89–90)