Galliskiite $Ca_4Al_2(PO_4)_2F_8 \cdot 5H_2O$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As crude platy crystals elongated along [001] and flattened on {010}, with frosty surfaces, to 0.5 mm. *Twinning*: Simple contact and polysynthetic twinning on {100} by rotation about [010] is ubiquitous.

Physical Properties: *Cleavage*: Two fair at ~90°, probably {010} and {001}. *Tenacity*: Brittle. *Fracture*: Conchoidal to irregular. Hardness = 2.5 D(meas.) = 2.67(3) D(calc.) = 2.670 Dissolves slowly in concentrated HCl.

Optical Properties: Transparent. *Color*: Colorless. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Biaxial (+). α = 1.493(1) β = 1.495(1) γ = 1.520(1) 2V(meas.) = 33(5)° 2V(calc.) = 32° *Dispersion: r* < *v*. *Orientation*: *Z* ≈ *b*, *X* and *Z* at 40-50° from *a* and *c*.

Cell Data: *Space Group*: $P\bar{1}$. *a* = 6.1933(7) *b* = 9.871(1) *c* = 13.580(2) α = 89.716(3)° β = 75.303(4)° γ = 88.683(4)° Z = 2

X-ray Powder Pattern: Gigante pegmatite, Punilla department, Córdoba Province, Argentina. 5.994 (100), 2.945 (85), 7.904 (70), 3.280 (58), 2.887 (44), 3.113 (30), 2.262 (27)

Chemistry:

	(1)	(2)
CaO	34.71	34.71
MgO	0.01	
FeO	0.10	
MnO	0.17	
Al_2O_3	15.92	15.78
SiO_2	0.06	
TiO_2	0.01	
P_2O_5	21.94	21.96
F	21.35	23.52
H_2O	[15.08]	13.94
- O = F	8.99	9.90
Total	100.39	100.00

(1) Gigante pegmatite, Punilla department, Córdoba Province, Argentina; average of 12 electron microprobe analyses, H_2O calculated from stoichiometry; corresponding to $(Ca_{3.98}Mn_{0.02}Fe_{0.01})_{\Sigma=4.0}Al_{2.01}(P_{1.99}Si_{0.01}O_8)F_{7.23}(OH)_{0.77} \cdot 5H_2O$. (2) $Ca_4Al_2(PO_4)_2F_8 \cdot 5H_2O$.

Occurrence: A late-stage hydrothermal mineral that crystallized from fluorine-rich solutions in intragranitic pegmatite.

Association: Morinite, strengite.

Distribution: From the Gigante pegmatite, 18.45 km west-southwest of Tanti, Punilla department, Córdoba Province, Argentina.

Name: Honors Miguel Ángel Galliski (b. 1948), Argentine mineralogist and pegmatite specialist for his research on the pegmatites of the Pampean Pegmatite Province of northwestern Argentina.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (62500).

References: (1) Kampf, A.R., F. Colombo, W.B. Simmons, A.U. Falster, and J.W. Nizamoff (2010) Galliskiite, $Ca_4Al_2(PO_4)_2F_8 \cdot 5H_2O$, a new mineral from the Gigante granitic pegmatite, Córdoba province, Argentina. Amer. Mineral., 95, 392-396.