Chemical Information and Mineralogy of Ken Snyder Au-Ag Mine

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NDSU Petrology Geol 422 April 30, 2014

urpose

Conduct Research

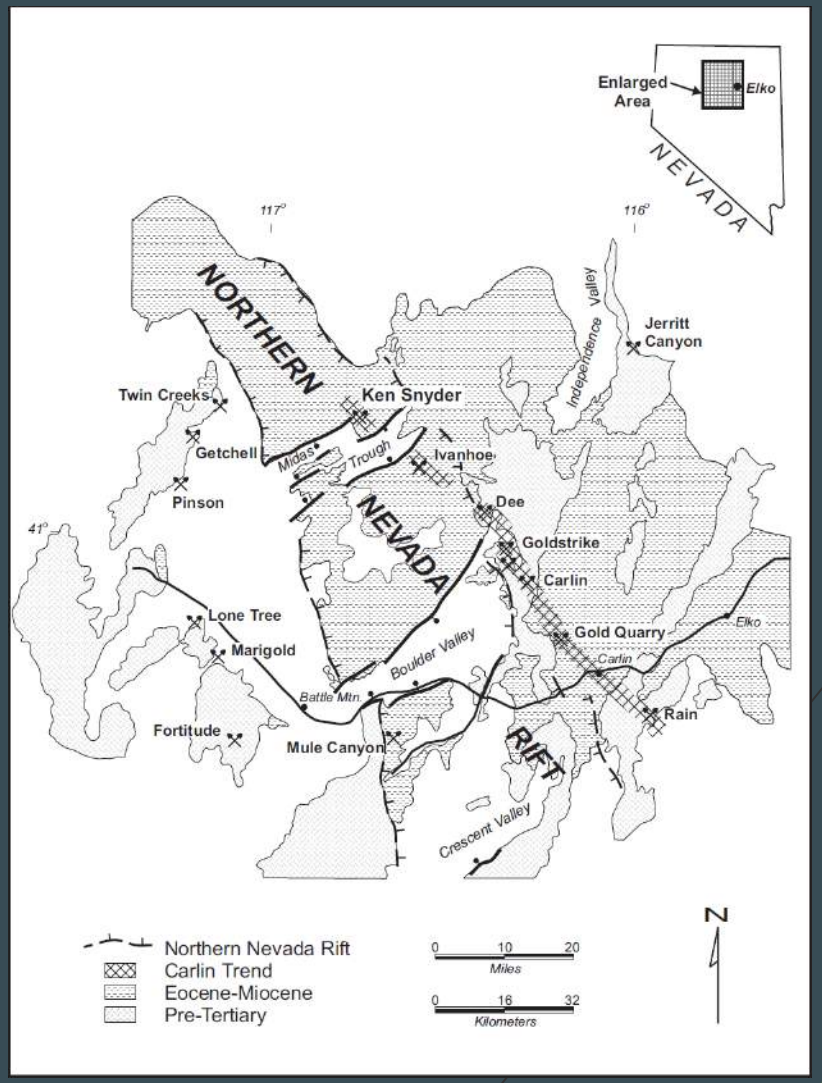
- SEM
- Reflected Light Microscopy
- XRF

Determine the Mineralogy

- Using data from research

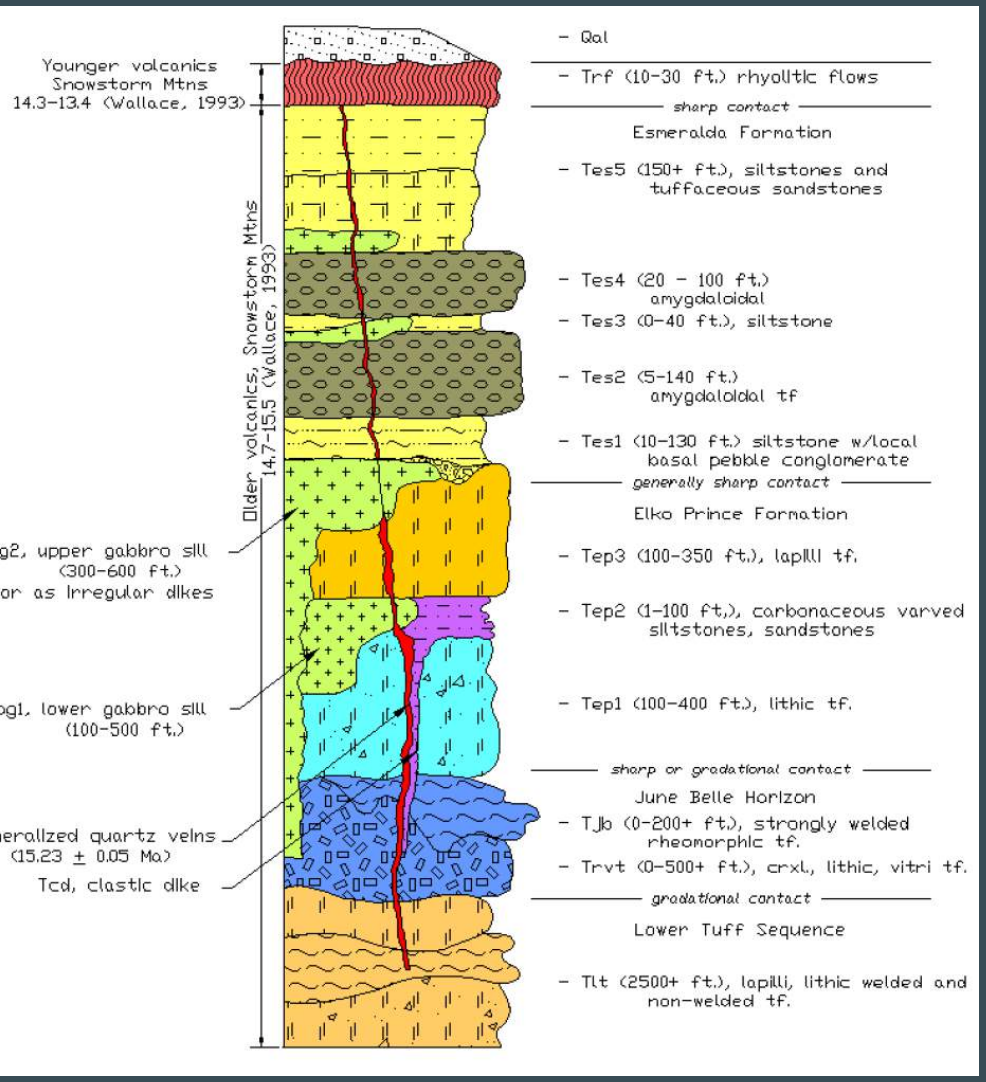
ocation and Background

- Located in West Elko County, Nevada
  - NE ¼, Section 28, T39N, R46E
- Discovered By Ken Snyder (1994)
  - Franco-Nevada
- Part of the Carlin Trend deposit
  - Midas/Golden Circle District
- 3,738,500 oz. of Gold (1998)
  - 2,726,800 tons
  - 1.115 oz./ton gold
  - 12.82 oz./ton silver



oto from Goldstrand, P.M., and Schmidt, K.W

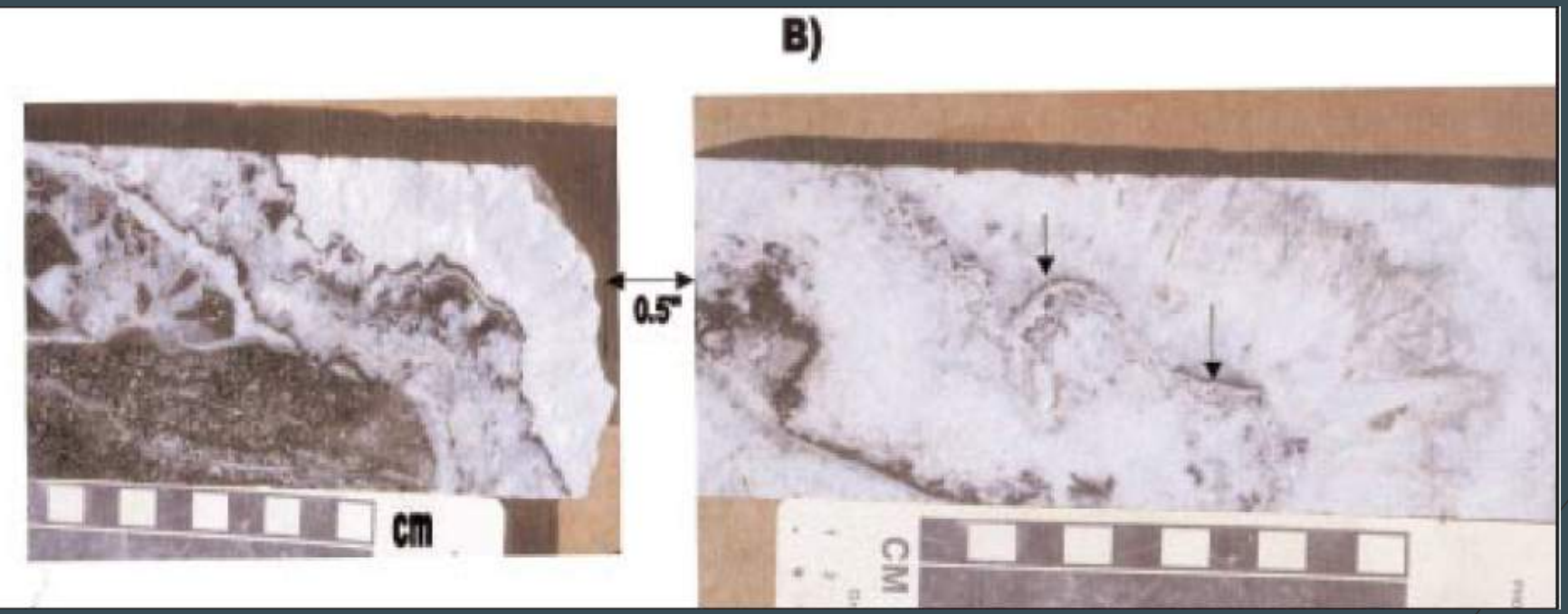
idas Area Stratigraphy



from Goldstrand, P.M., and Schmidt, K.W

- Epithermal Vein
  - Low Salinity(<2.9wt.% NaCl)
  - Formed in Faults
    - Deep-seated, permeable conduits
  - Multiple Fluid Pulses
    - Multiple, inconsistent bands
- Ore Location (3 Formations)
  - June Belle
  - Elko Prince
  - Esmeralda

ein Photos



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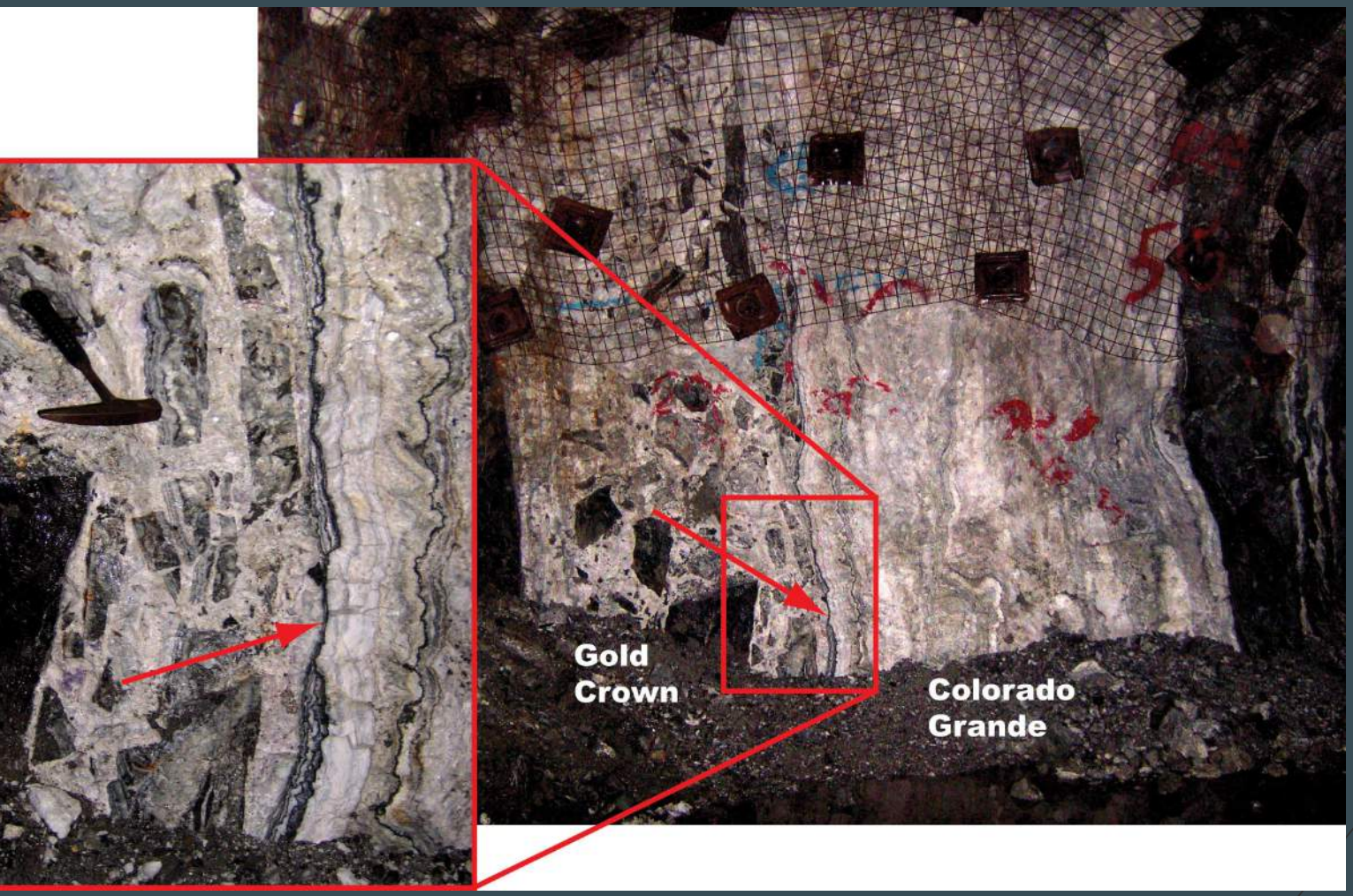


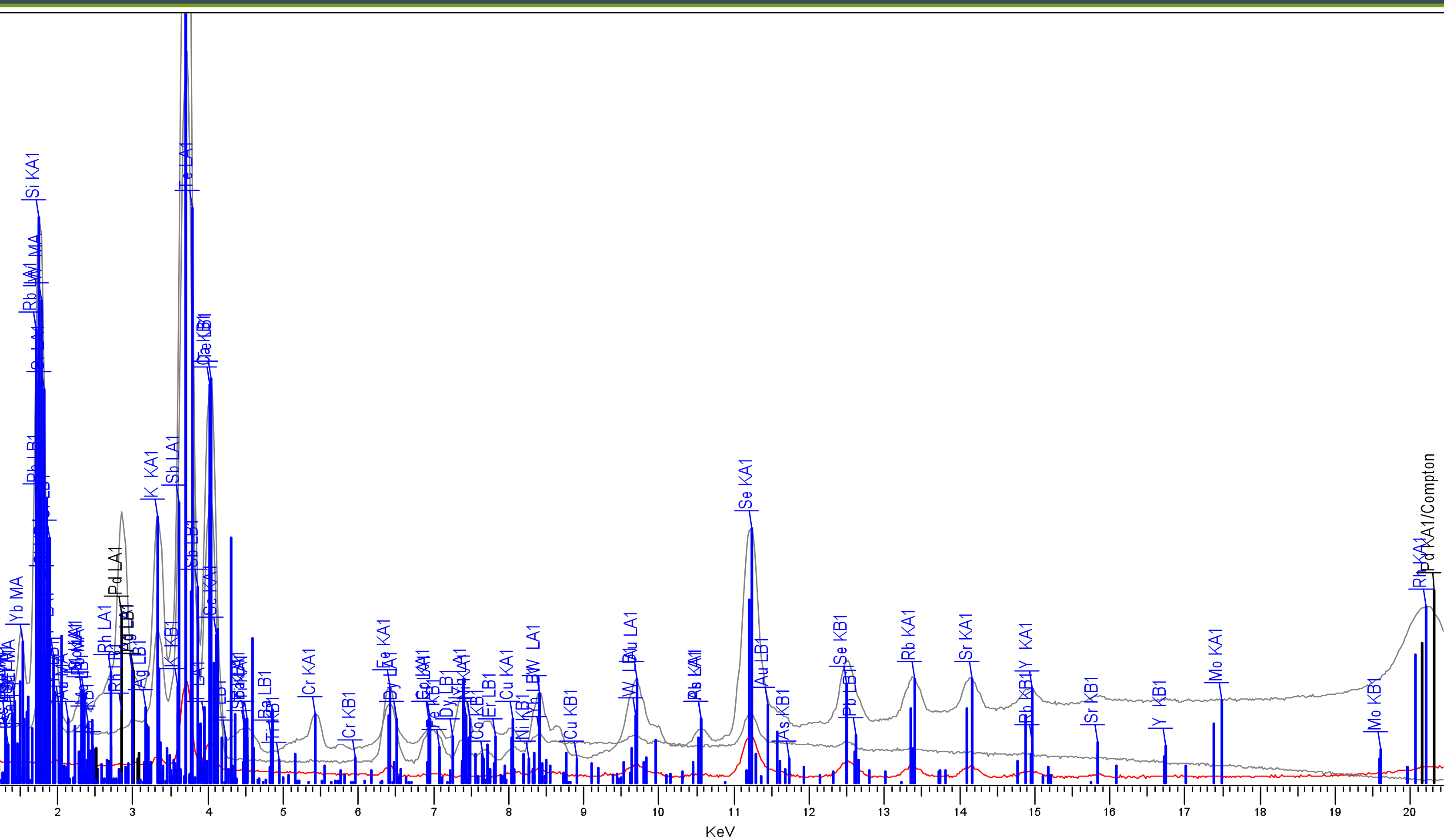
from Riederer, M.J., and Brown, P.E

and Specimen

ethods

- XRF
  - X-Ray Fluorescence
- Reflected Light Microscopy
- SEM
  - Scanning Electron Microscope

RF



Si KA1
Rb LA1
W MA
Yb MA
Rh LB1
K KA1
Sb LA1
Pd LA1
Ag LB1
Rh LA1
Cr KA1
Cr KB1
Fe KA1
Cu KA1
Cu KB1
W LA1
Au LA1
Se KA1
Au LB1
As KB1
Se KB1
Pb LB1
Rb KA1
Sr KA1
Y KA1
Rb KB1
Sr KB1
Y KB1
Mo KA1
Mo KB1
Rh KA1
Pd KA1/Compton
2
3
4
5
6
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9
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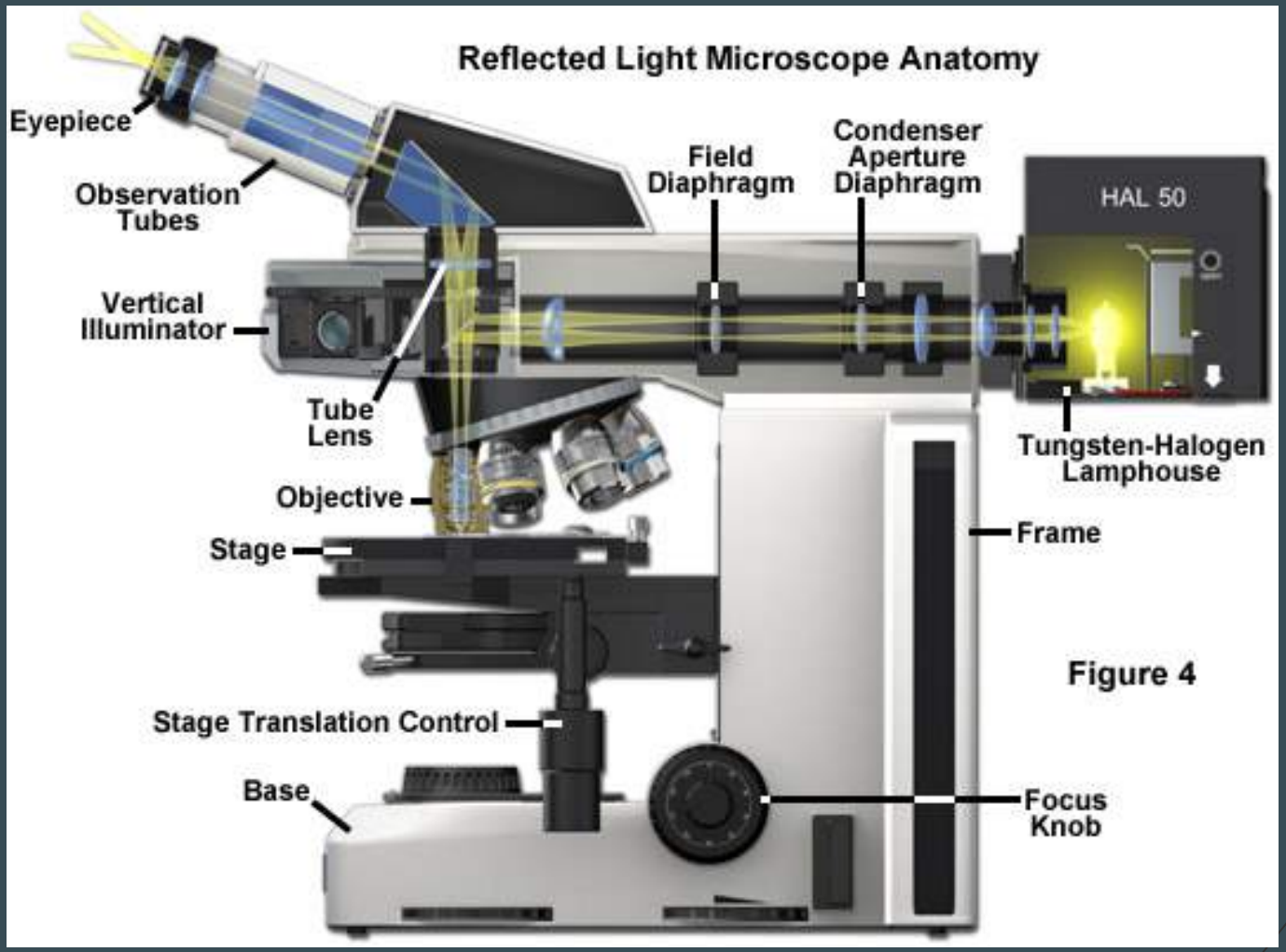
RF

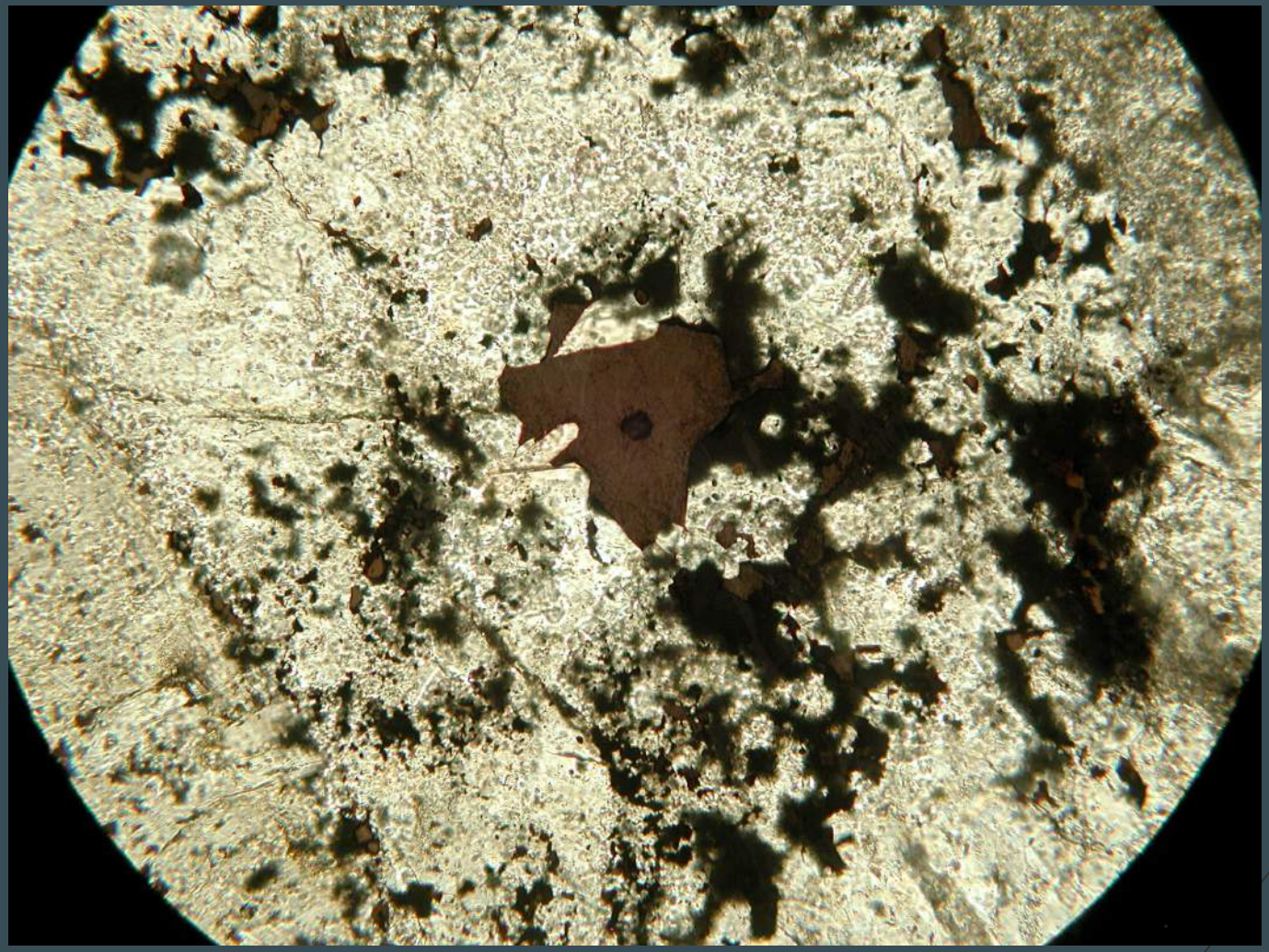
mula	Midas	Stat. error	LLD
2	38.41%	0.09%	159.0 PPM
O3	5.91%	0.71%	256.4 PPM
O3	0.08%	0.51%	8.2 PPM
)	54.29%	0.06%	243.6 PPM
O	0.00%		366.5 PPM
O	0.02%		6.7 PPM
2O	1.11%		609.6 PPM
)	3.45%	0.41%	325.4 PPM
05	0.35%	1.24%	71.6 PPM
2	0.00%		41.1 PPM
	4.2 PPM	0.37%	0.0 PPM

eflected Light Microscopy



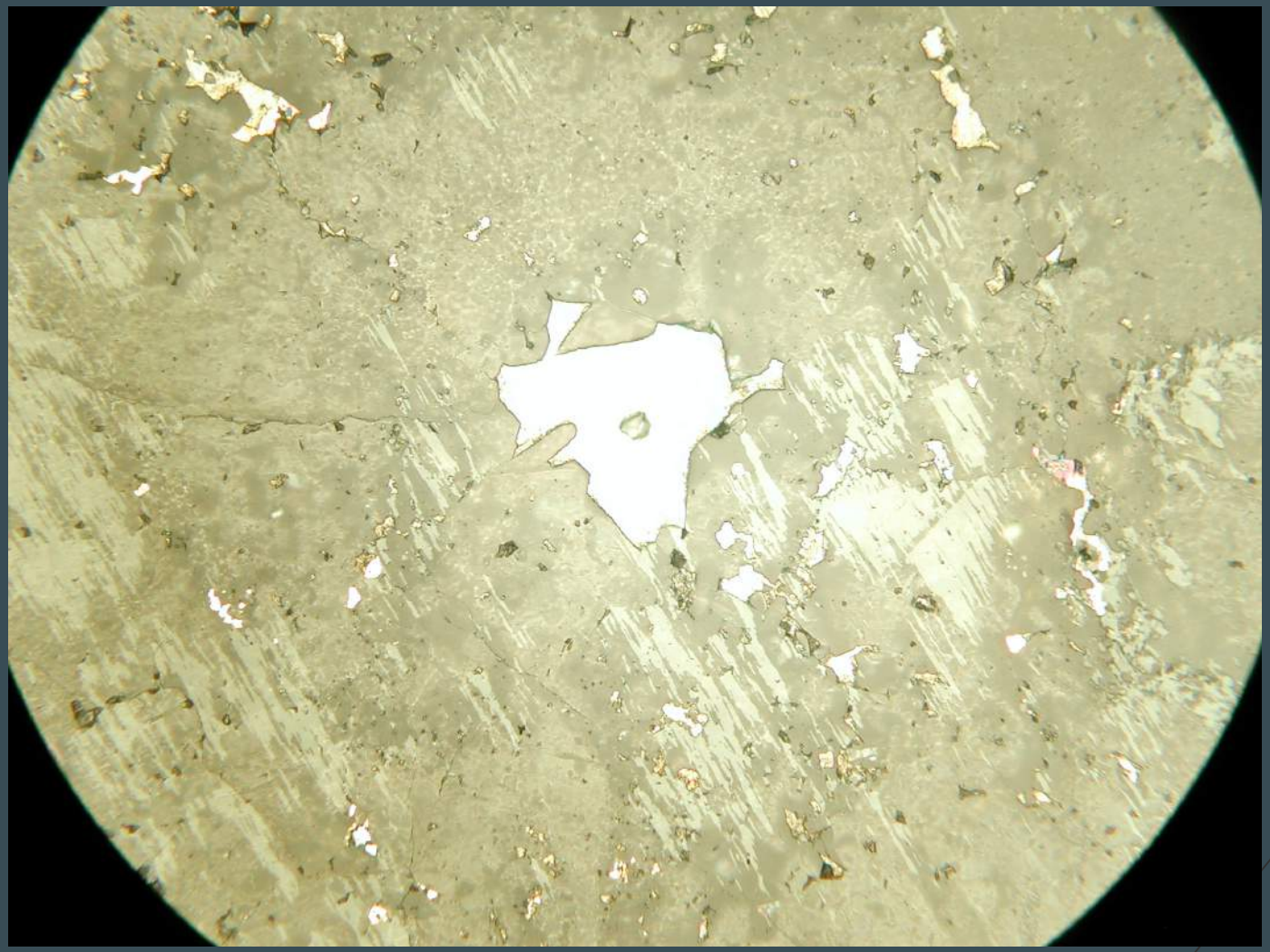
http://zeiss-campus.magnet.fsu.edu/articles/basics/images/opticaltrainfigure4.jpg
Olympus BX60

eflected Light Microscopy

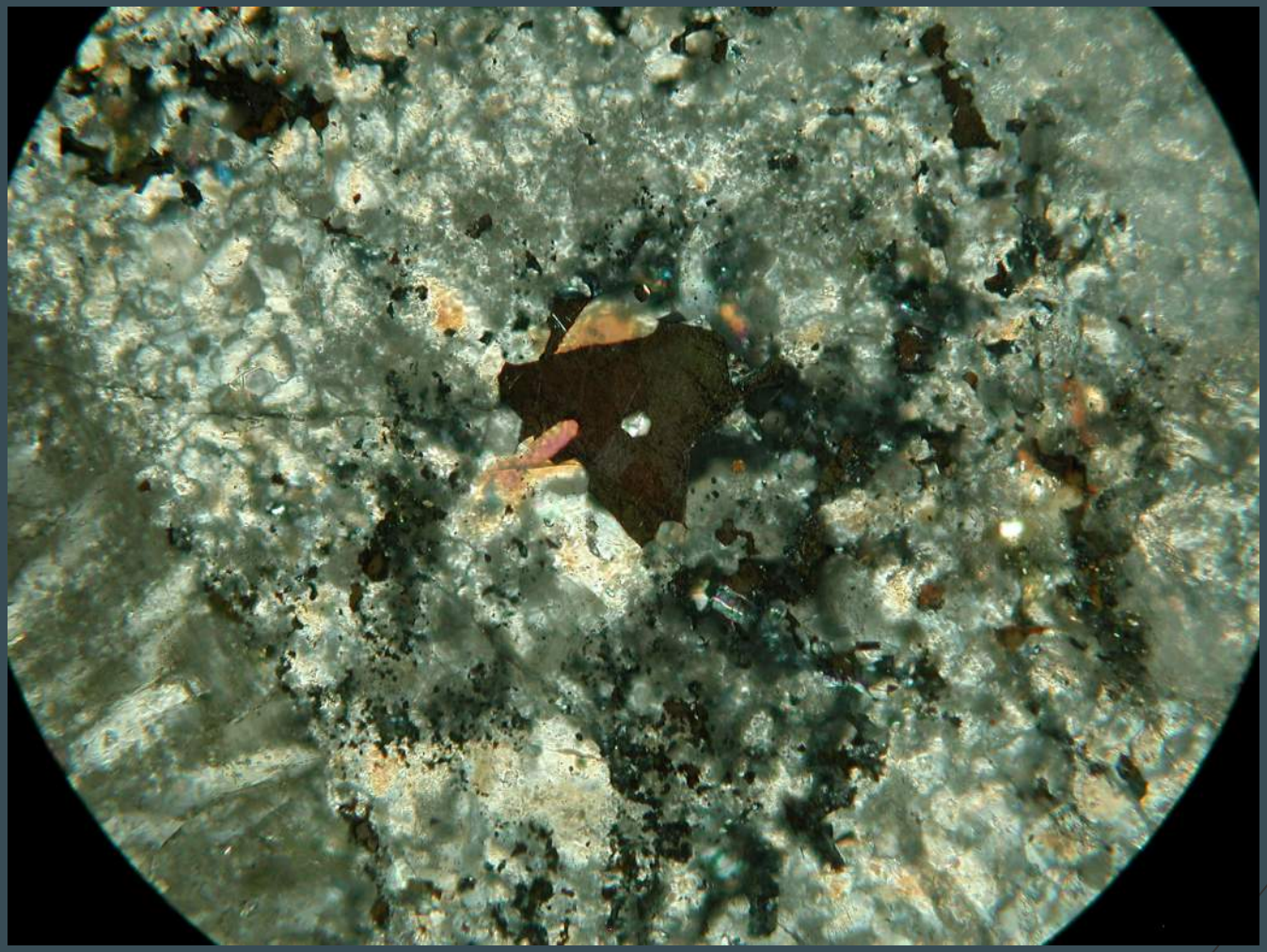


ransmitted Light

eflected Light Microscopy

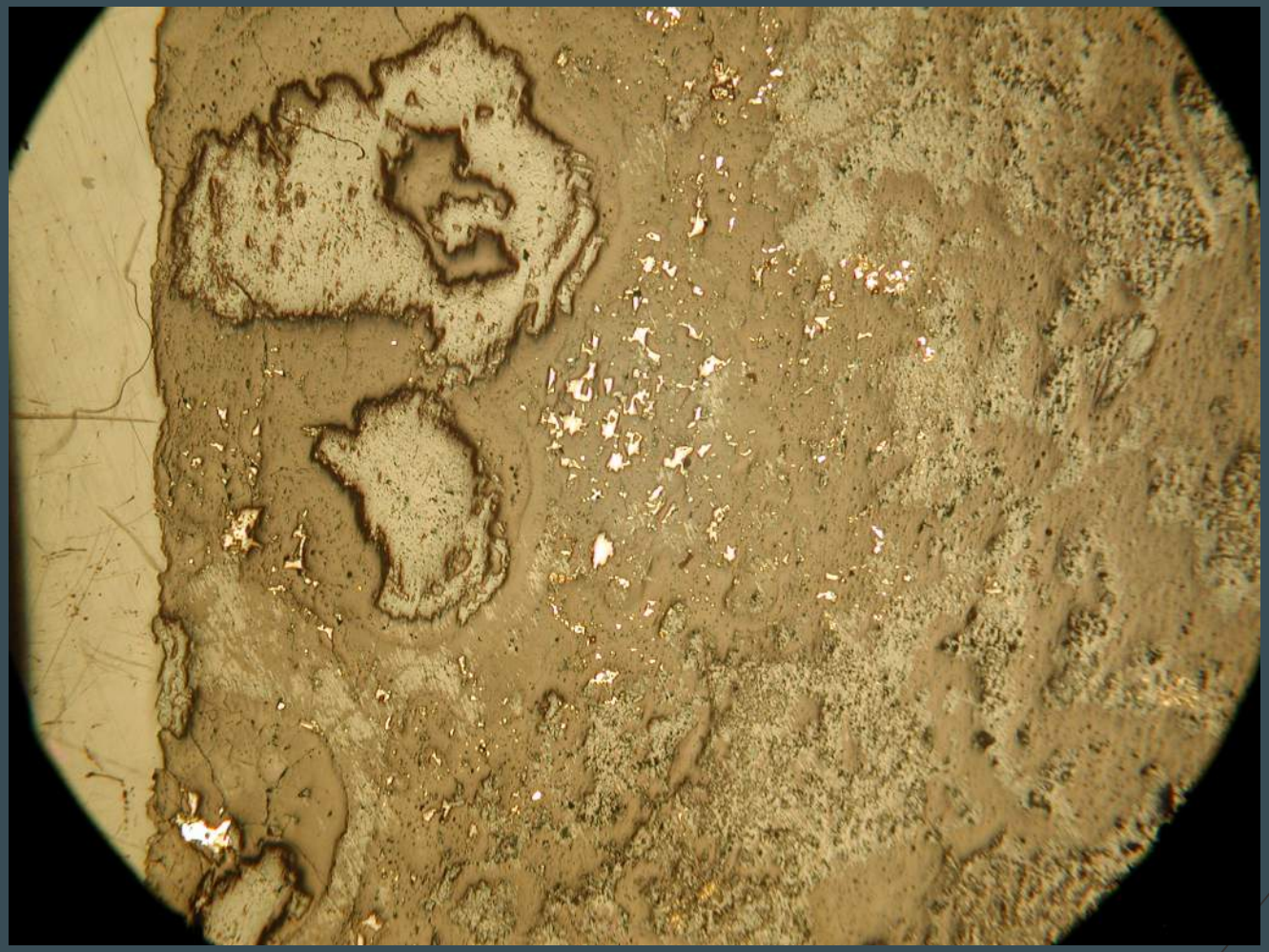


eflected Light Microscopy



eflected Light Nic +

eflected Light Microscopy

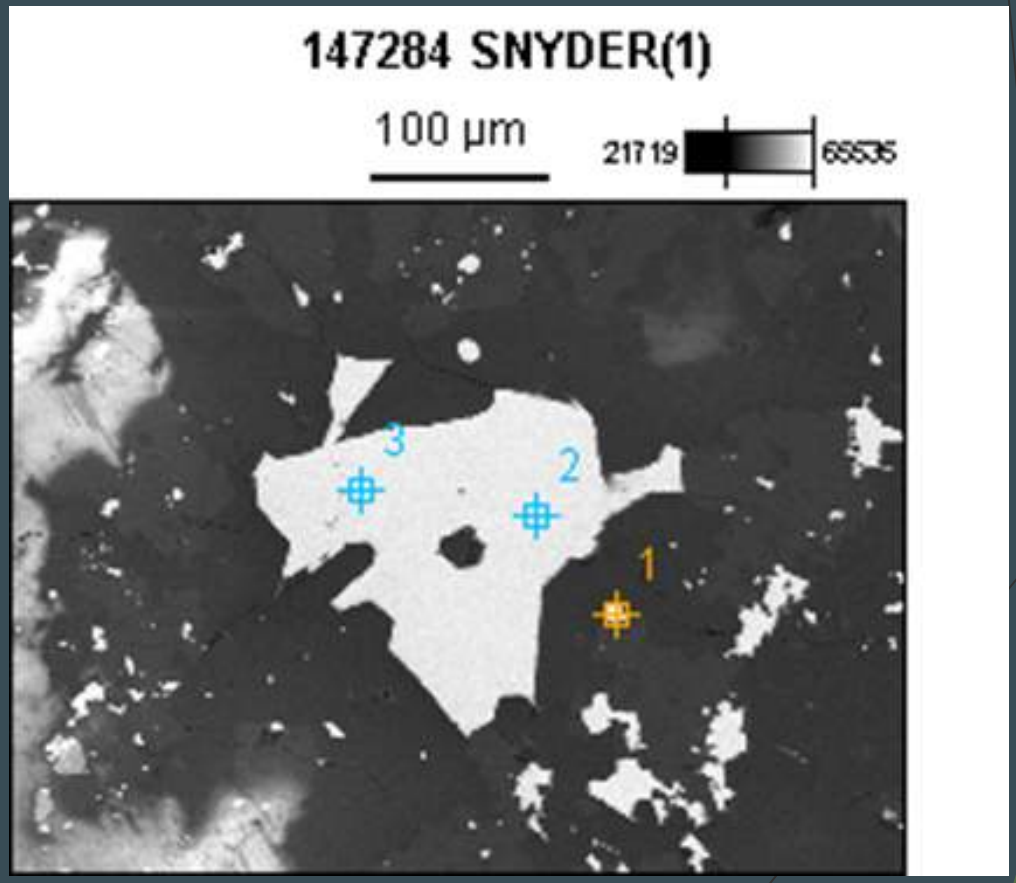


eflected Light Microscopy

Reflected Light Nic +

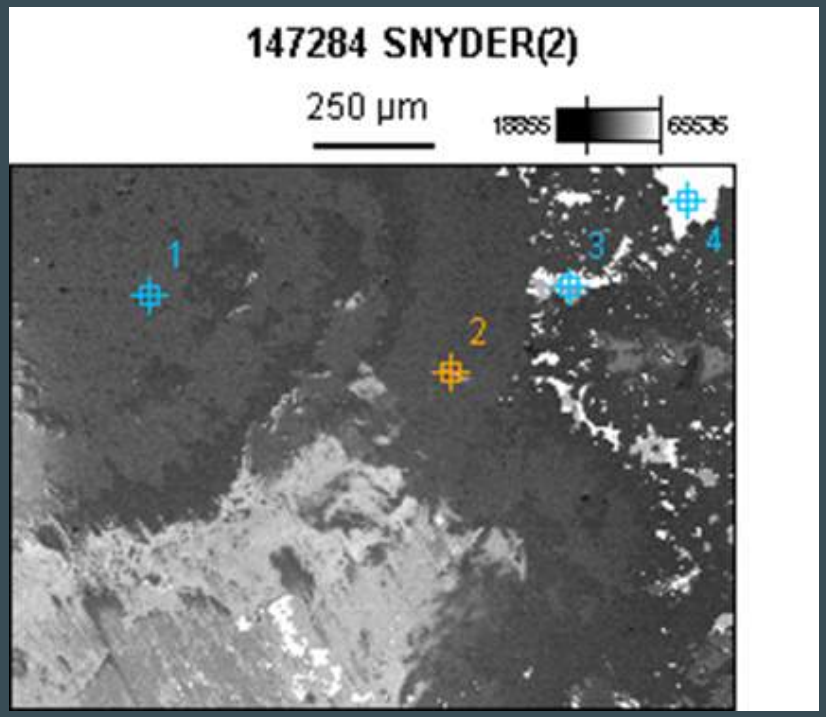
EM

c %S	Se	Ag	Au
1		51.88	48.12
2	6.49	30.79	62.72
3	6.61	30.68	62.71
	Atomic Ratios		
1		51.88	48.12
2	0.21	1.00	2.04
3	0.22	1.00	2.04



EM

mic %	C	O	Al	Si	S	K	Ca	Fe	Cu	Se	Ag
t 1	44.13	46.19		0.10			9.59				
t 2		75.74	5.20	15.48		3.58					
t 3					57.40			22.30	20.22		
t 4					4.55					30.10	65.35
mic Ratios											
t 1	4.60	4.82		0.01			1.00				
t 2		21.16	1.45	4.32		1.00					
t 3					2.84			1.10	1.00		
t 4					0.15					1.00	2.17



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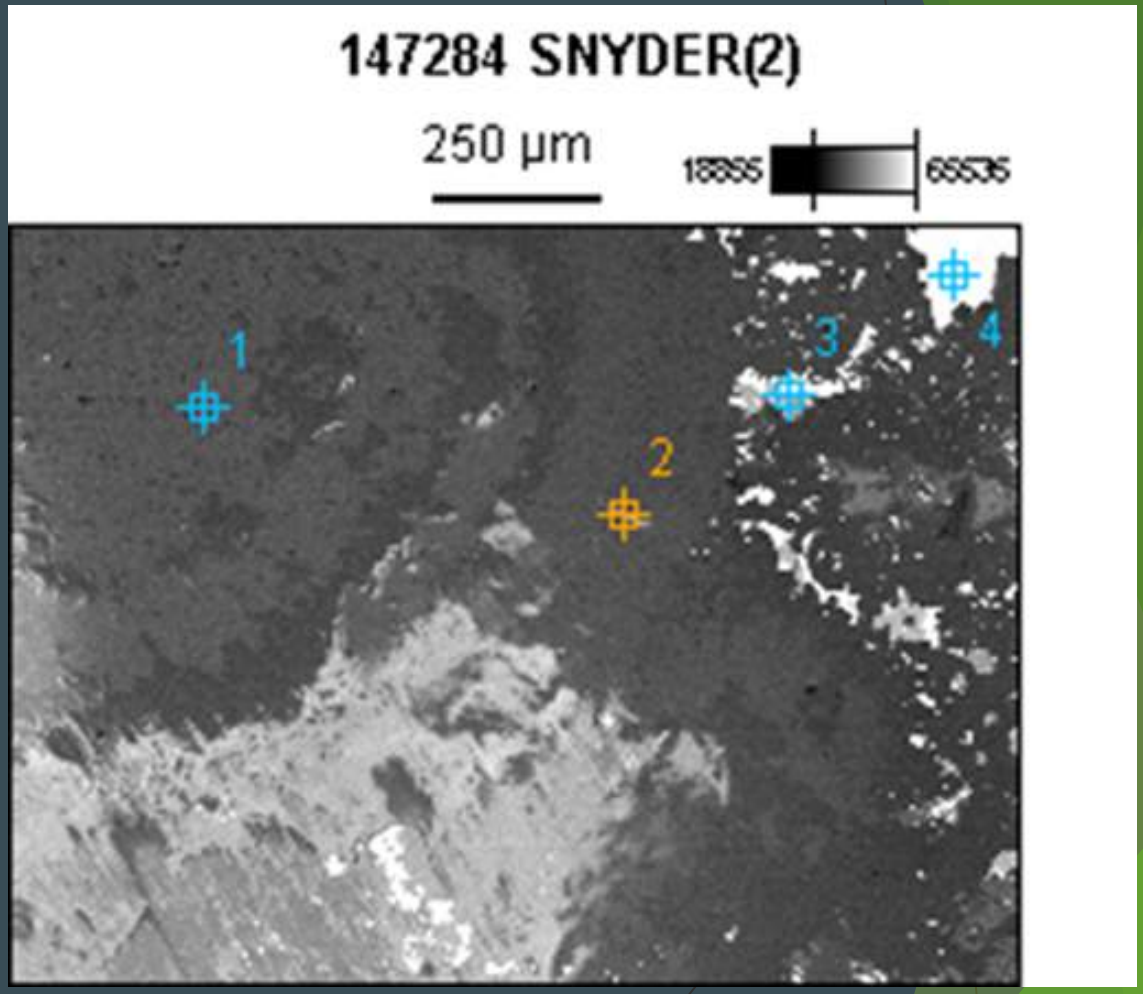

Mineralogy

Photo	Point	Calculated Mineral Formula	Mineral	True Formulas
er 1	1	$Au_{48.12}Ag_{51.88}$	Electrum	AgAu
	2	$Ag_{2.04}SeS_{.21}$	Naumannite	Ag_2Se
	3	$Ag_{2.04}SeS_{.22}$	Naumannite	Ag_2Se
er 2	1	$CaC_{4.60}O_{4.82}Si_{.01}$	Calcite And Quartz	$CaCO_3$ and SiO_2
	2	$KAl_{1.45}Si_{4.32}O_{21.16}$	Adularia And Quartz	$KAlSi_3O_8$ and SiO_2
	3	$CuFe_{1.10}S_{2.84}$	Chalcopyrite	$CuFeS_2$
	4	$Ag_{2.17}SeS_{.15}$	Naumannite	Ag_2Se

inerals Not Pictured

Galena
- PbS

Pyrite
- FeS_2

onclusion

Demonstrated Research Tools

- XRF
- Reflected Light Microscopy
- SEM

Shown Mineralogy

- Calcite
- Quartz
- Adularia
- Electrum
- Naumannite
- Chalcopyrite
- Pyrite
- Galena