

# 2020 and 2021 zircons to hit again

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# Framing

Additional zircon grains of interest were chosen for CL imaging and a second or third round of dating based on favourable, near Casino suite ages from the first or second round of analysis. Some grains had large errors or were highly discordant, and other grains were chosen in order to improve the precision on the age by using a weighted mean of the two (or more) spot analyses. The first and second round of analyses returned high LODs for some REEs, so the third round of analyses has instrument settings tweaked to improve LODs in order to calculate Ce/Ce\* and Eu/Eu\* anomalies for porphyry fertility.

In the following slides, 2SE absolute errors are stated on the grain labels, the 206/238-207/235 discordance is shown, and all ages are 207-corrected (Stacey and Kramers) 206Pb/238U ages. The weighted averages are only meaningful when a consistent CL zone is observed – the diagrams are just used to visualize the ages and errors.

20  $\mu$ m

# 21JM013B\_70&152

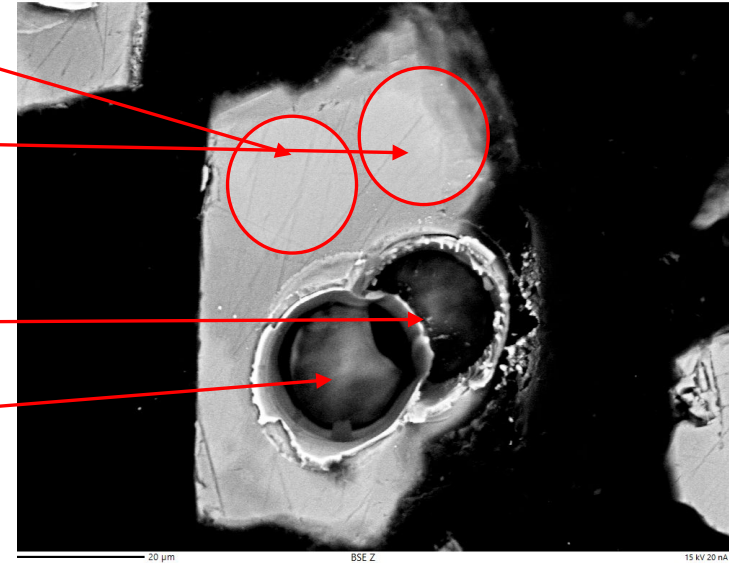
Two more spots

62.1 $\pm$  1.2 Ma (29.2% disc.)

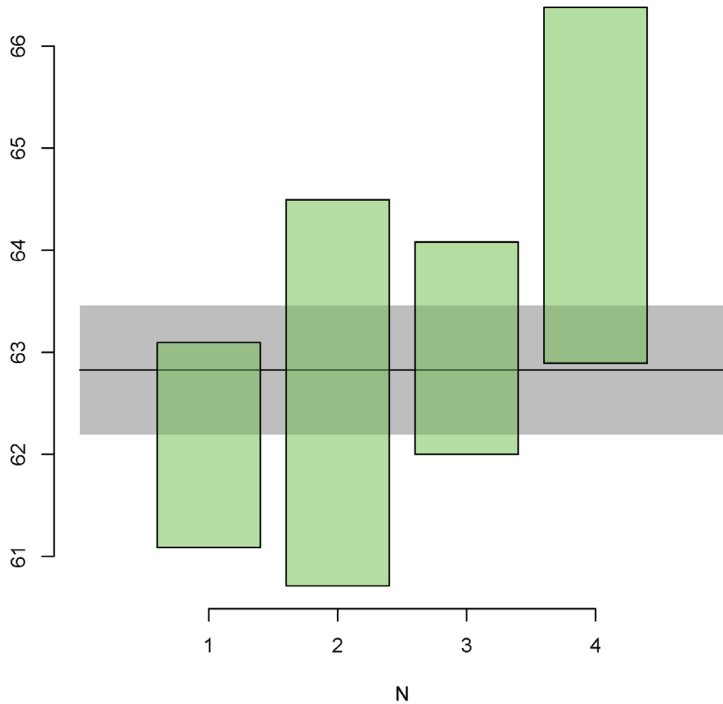
63.0 $\pm$  1.1 Ma (5.5% disc.)

63.0 $\pm$  1.8 Ma (-10.8% disc.)

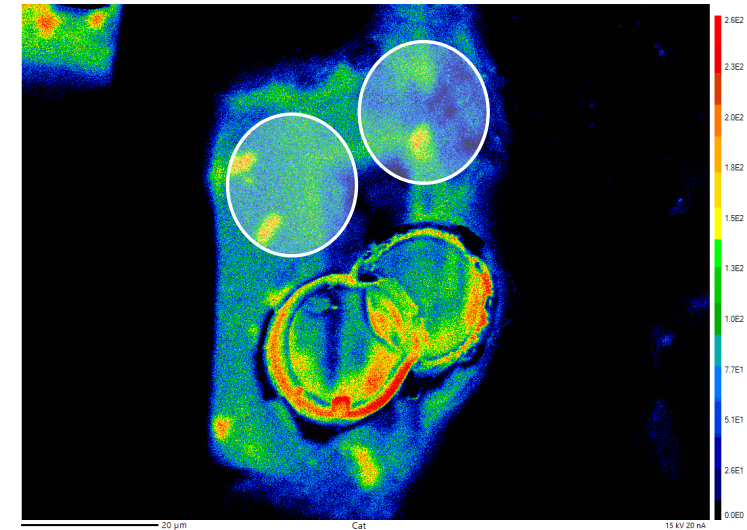
65.2 $\pm$  1.8 Ma (4.4% disc.)



mean = 62.83 $\pm$ 0.32 | 0.63 Ma (n=4/4)  
MSWD = 2.14, p( $\chi^2$ ) = 0.093



~62 Ma age



20  $\mu\text{m}$

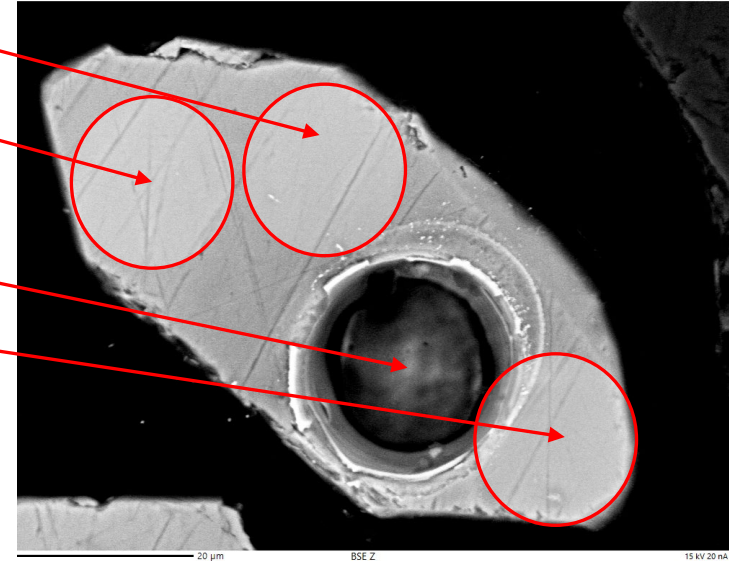
21JM013B\_206

65.6  $\pm$  2.9 Ma (55.9% disc.)

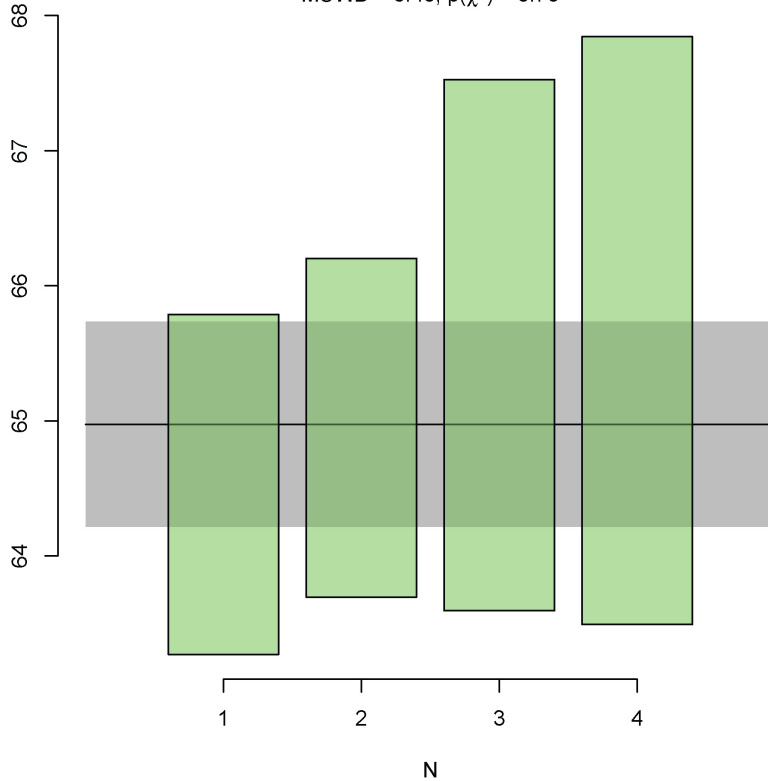
64.7  $\pm$  1.3 Ma (-5.0% disc.)

66.2  $\pm$  2.0 Ma (6.2% disc.)

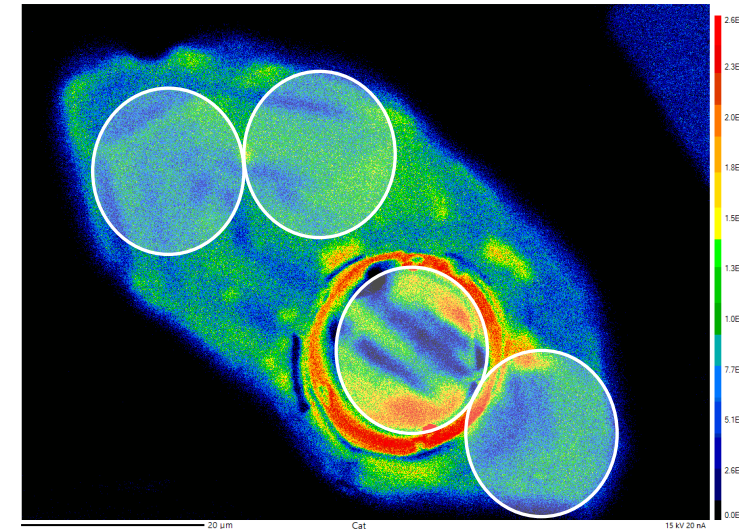
65.0  $\pm$  1.3 Ma (14.7% disc.)



mean = 64.97  $\pm$  0.39 | 0.76 Ma (n=4/4)  
MSWD = 0.40, p( $\chi^2$ ) = 0.75



Late Prospector  
Mtn age? 65 Ma





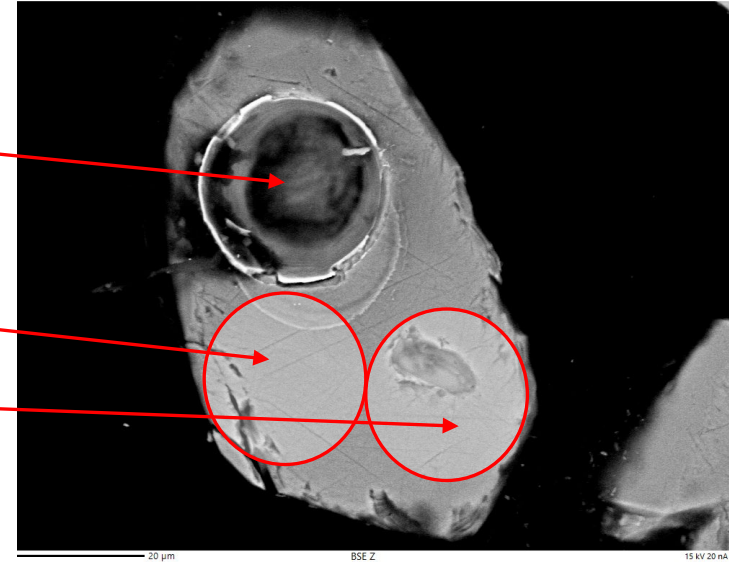
20  $\mu$ m

21JM014B\_02

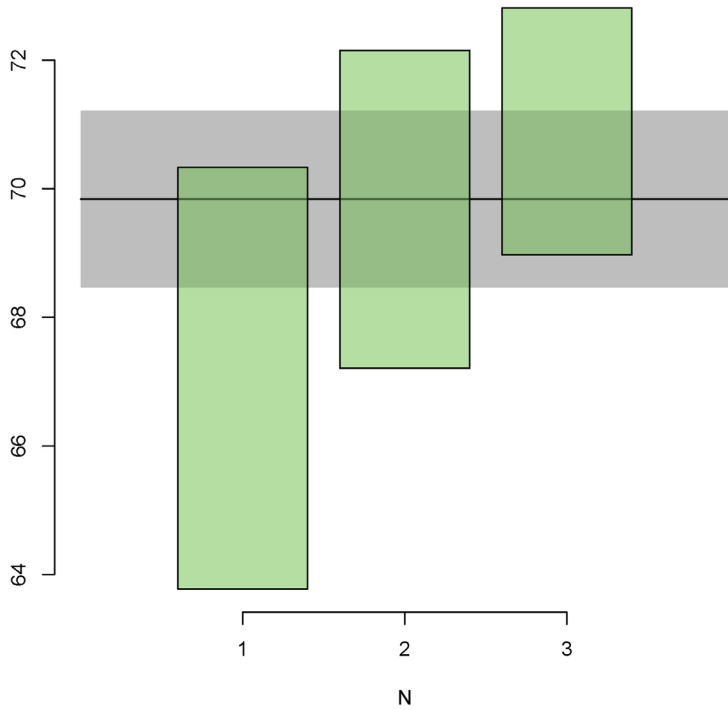
68.3  $\pm$  3.5 Ma (-12.8% disc.)

69.7  $\pm$  2.7 Ma (20.5% disc.)

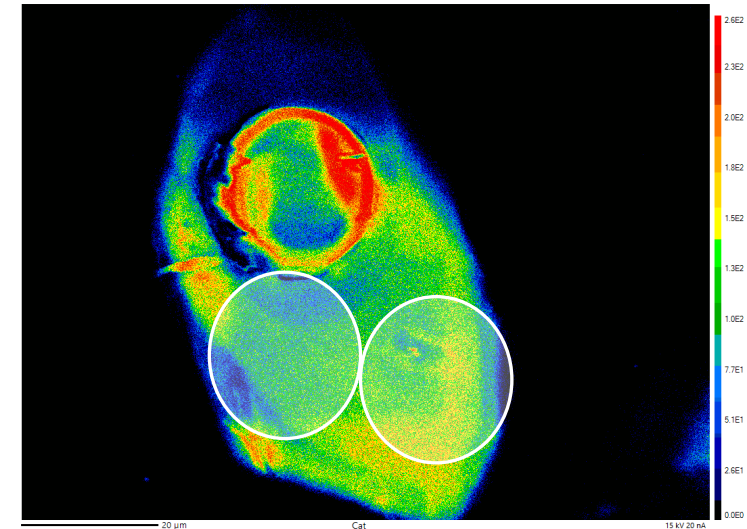
70.9  $\pm$  2.1 Ma (11.7% disc.)



mean = 69.84  $\pm$  0.70 | 1.38 Ma (n=3/3)  
MSWD = 1.97, p( $\chi^2$ ) = 0.14



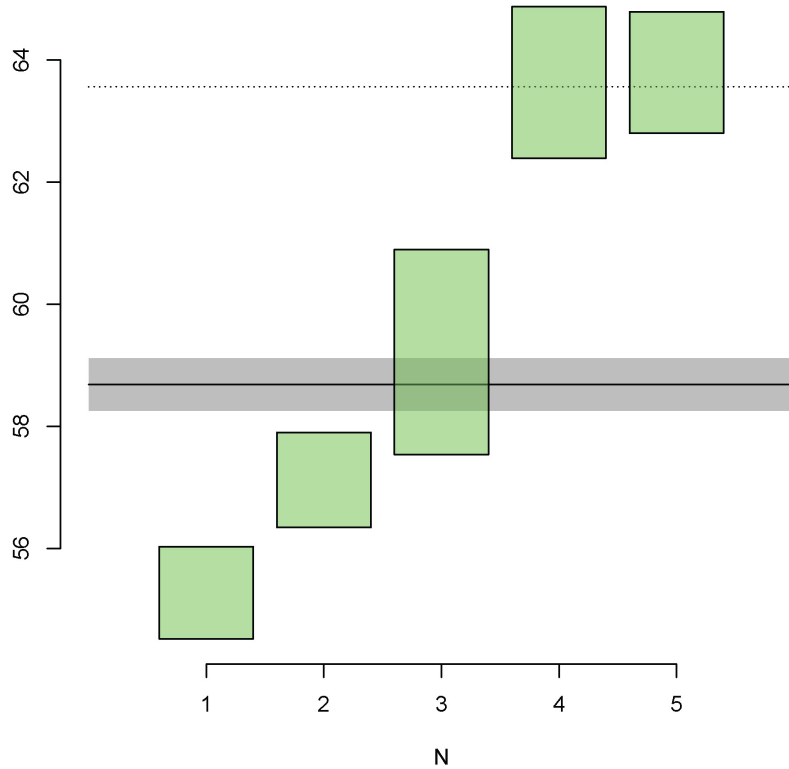
Casino to  
Prospector Mtn  
Suites, ~70 Ma



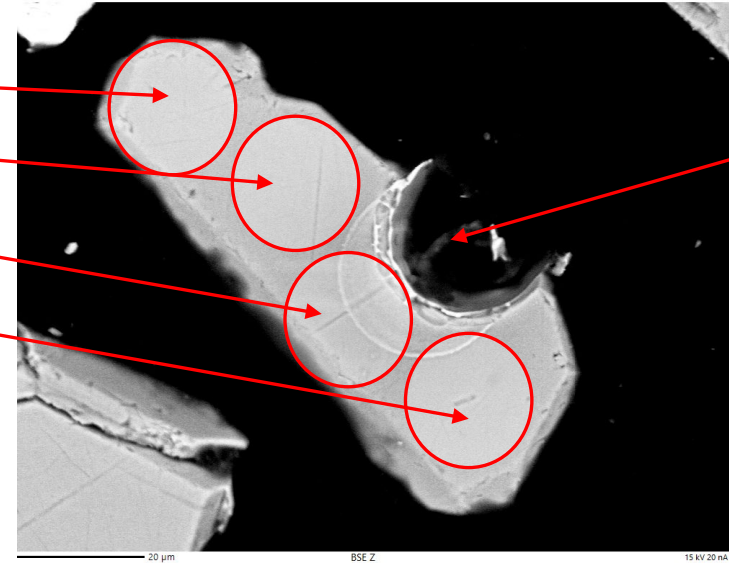
21JM015B\_53

- 55.3 ± 0.8 Ma (4.6% disc.)
- 63.6 ± 1.3 Ma (1.7% disc.)
- 63.8 ± 1.0 Ma (3.9% disc.)
- 57.1 ± 0.8 Ma (5.0% disc.)

mean = 58.68 ± 0.22 | 0.43 | 4.88 Ma (n=5/5)  
MSWD = 64.4, p(χ²) = 0

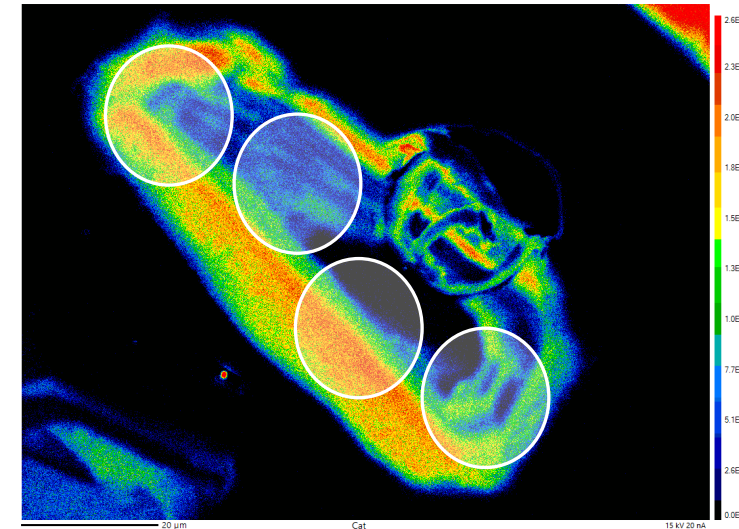


Mixed, Palaeocene  
ages.



20 µm

66.6 ± 2.3 Ma  
(60.2% disc.)



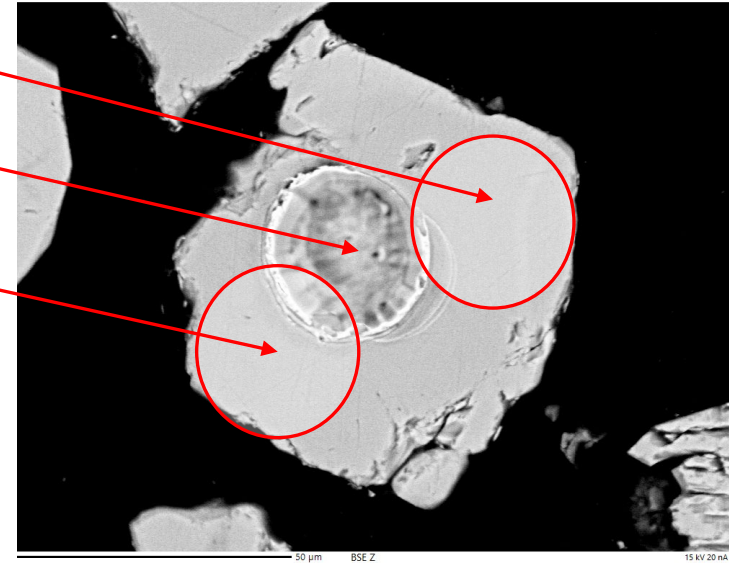
30  $\mu\text{m}$

21JM016B\_17

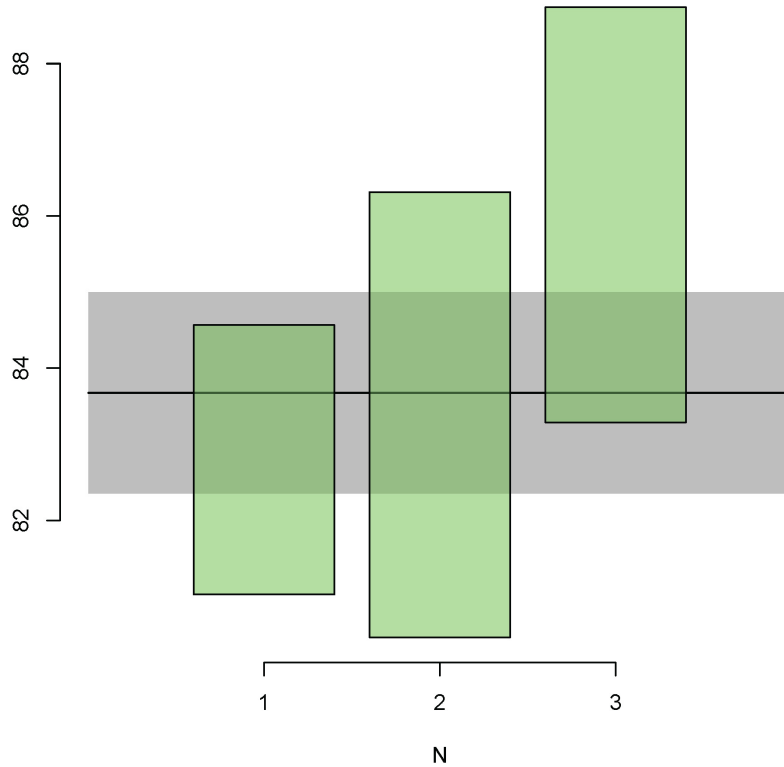
82.8  $\pm$  2.2 Ma (41.4% disc.)

84.1  $\pm$  3.0 Ma (-2.1% disc.)

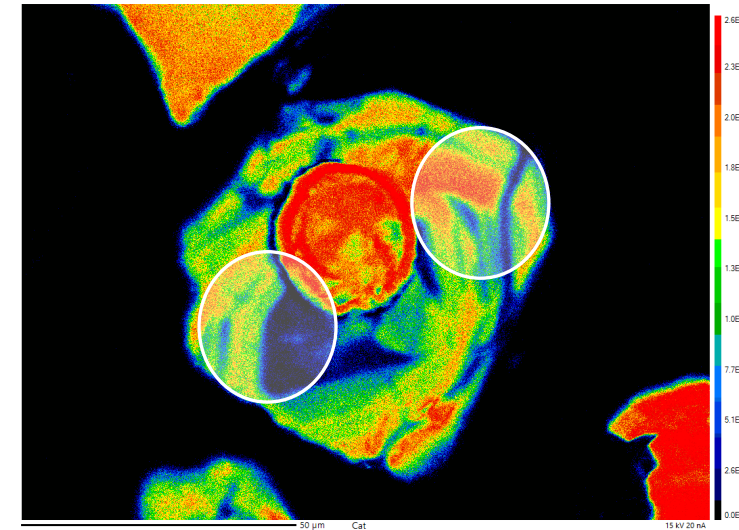
86.1  $\pm$  3 Ma (39.3% disc.)



mean = 83.68  $\pm$  0.68 | 1.32 Ma (n=3/3)  
MSWD = 1.91,  $p(\chi^2)$  = 0.15



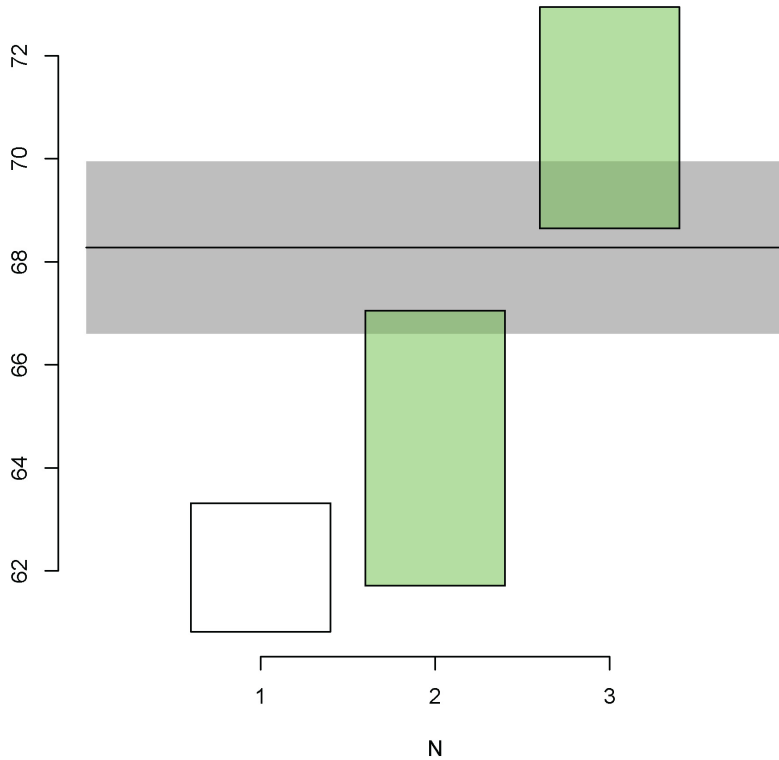
Possible early Casino Suite  $\sim$ 84 Ma



20 μm

21JM016B\_22

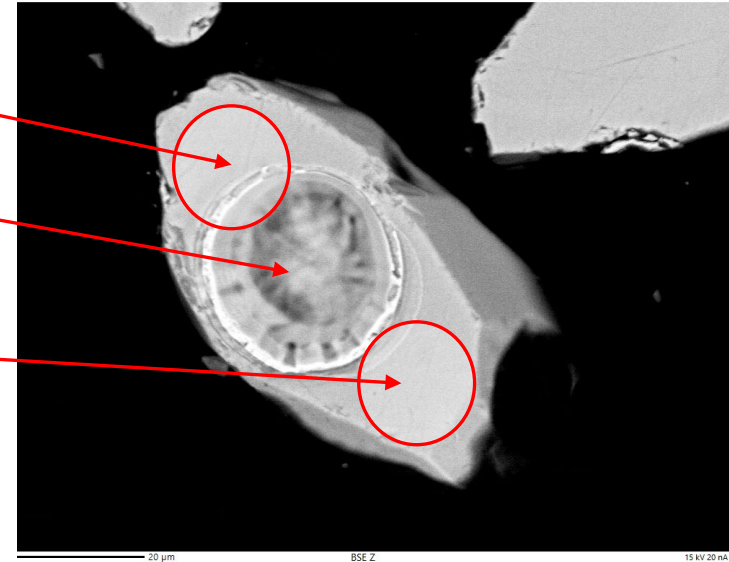
mean =  $68.28 \pm 0.85$  | 1.67 | 39.79 Ma (n=2/3)  
MSWD = 13.5,  $p(\chi^2) = 0.00024$



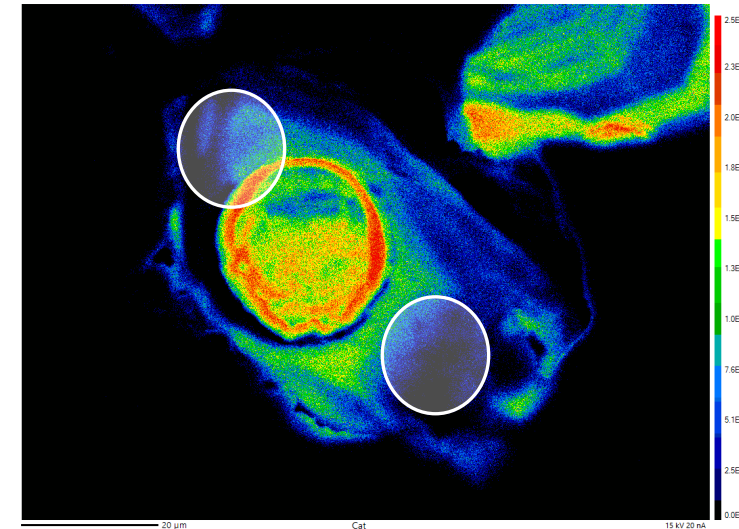
$62.1 \pm 1.3$  Ma (23.3% disc.)

$65.5 \pm 2.8$  Ma (3.5% disc.)

$70.6 \pm 2.2$  Ma (-1.9% disc.)



One discordant age omitted, giving a Prospector Mtn age ~68 Ma



30  $\mu$ m

21JM016B\_35

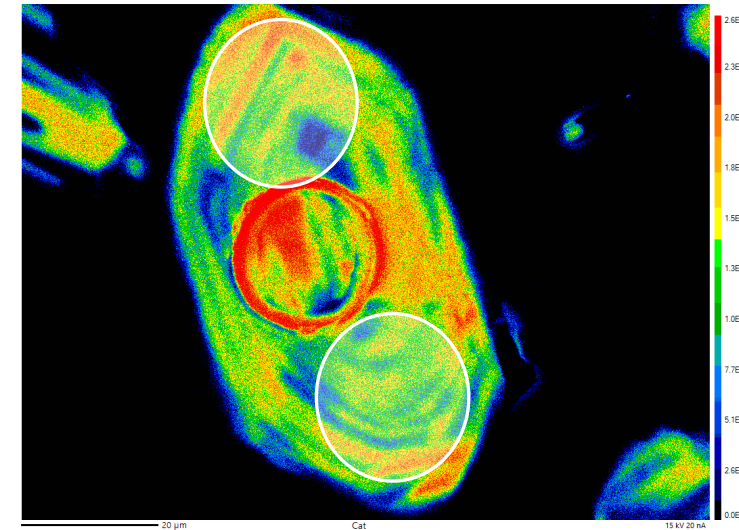
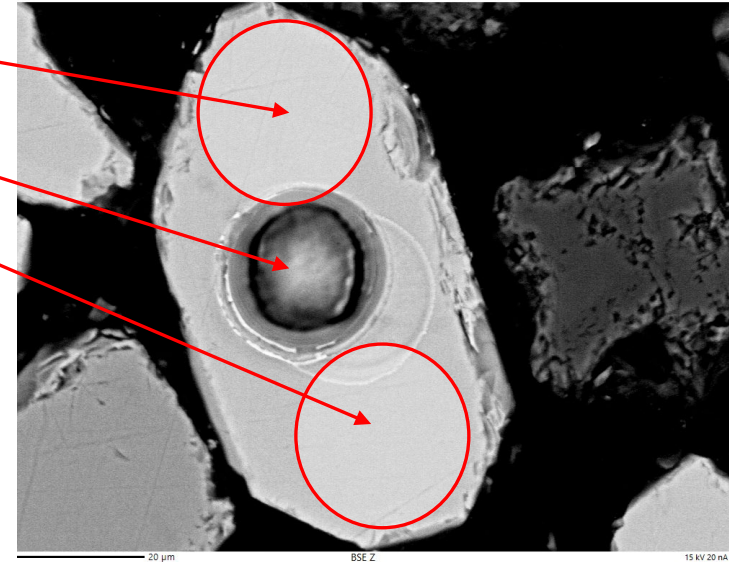
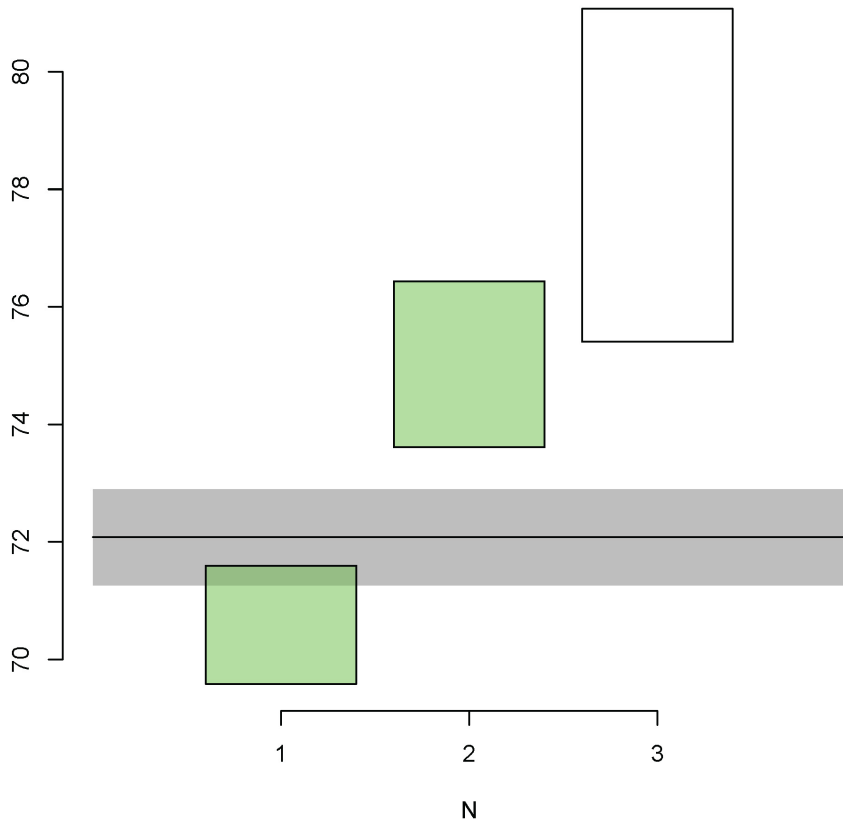
75.0 $\pm$  1.6 Ma (34.9% disc.)

79.0 $\pm$  2.9 Ma (-9.6% disc.)

70.6 $\pm$  1.1 Ma (29.7% disc.)

mean = 72.08 $\pm$ 0.42 | 0.82 | 26.61 Ma (n=2/3)  
MSWD = 25.2,  $p(\chi^2) = 0.00000053$

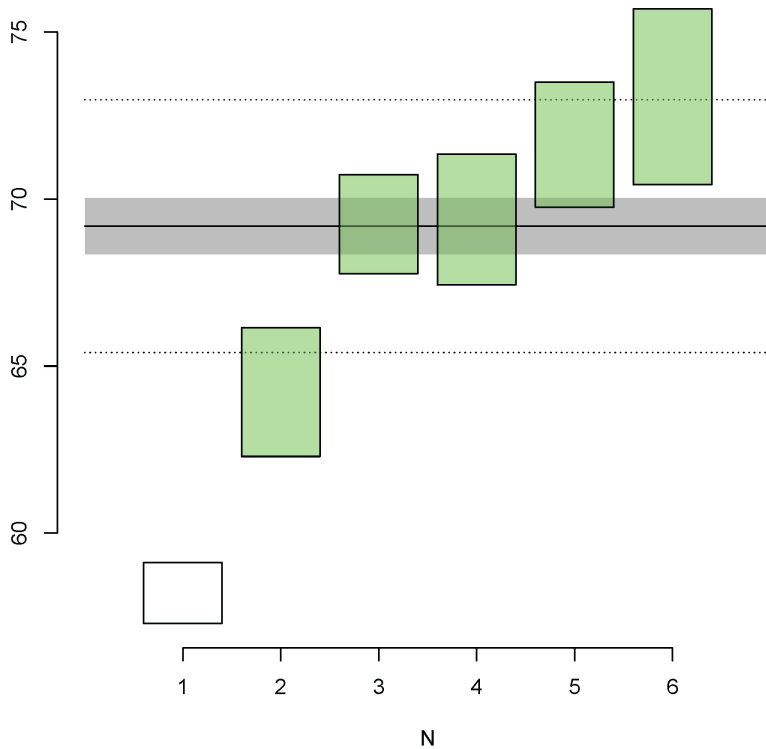
Casino Suite rim  
age  $\sim$ 72 Ma





21JM017B\_05

mean =  $69.19 \pm 0.43$  | 0.84 | 3.78 Ma (n=5/6)  
 MSWD = 10.1,  $p(\chi^2) = 0.000000037$

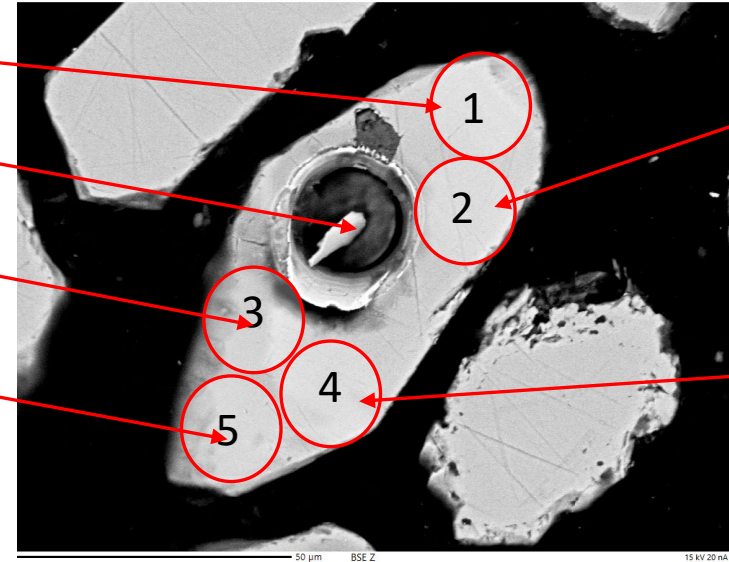


69.3 ± 1.5 Ma (3.1% disc.)

73.8 ± 2.8 Ma (-11.8% disc.)

64.2 ± 2.0 Ma (8.6% disc.)

69.4 ± 2.0 Ma (1.7% disc.)

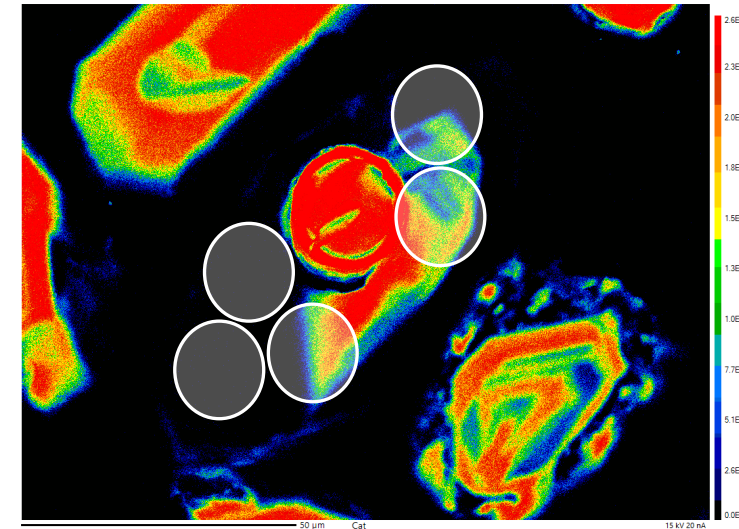


20 μm

71.6 ± 2.0 Ma  
(5.2% disc.)

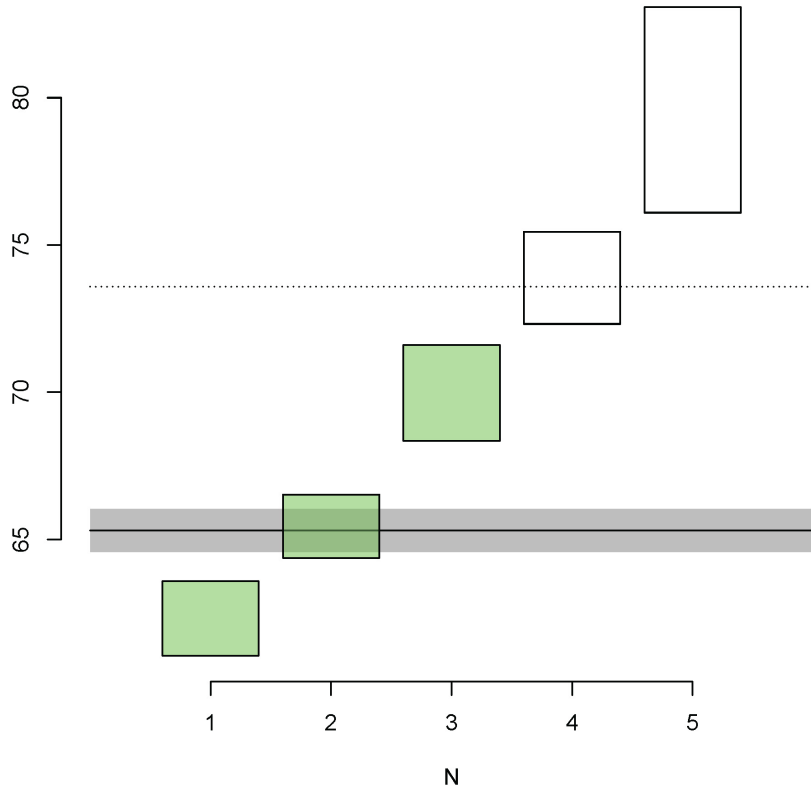
58.2 ± 1.0 Ma  
(2.2% disc.)

Casino Suite Core/RHS  
 with Prospector Mtn  
 rim/LHS?



# 21JM018B\_10

mean =  $65.31 \pm 0.37$  | 0.73 | 8.27 Ma (n=3/5)  
 MSWD = 26.6,  $p(\chi^2) = 0.0000000000029$

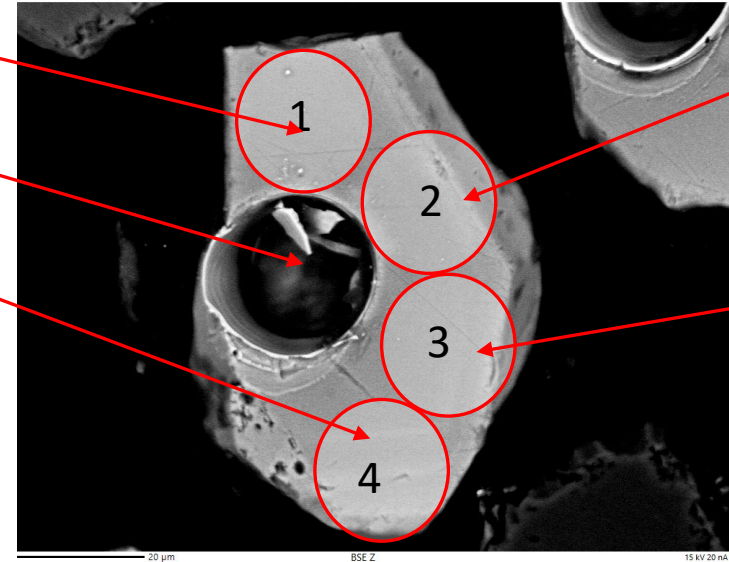


$65.5 \pm 1.1$  Ma (14.2% disc.)

$74.1 \pm 1.6$  Ma (-1.9% disc.)

$62.3 \pm 1.3$  Ma (15.2% disc.)

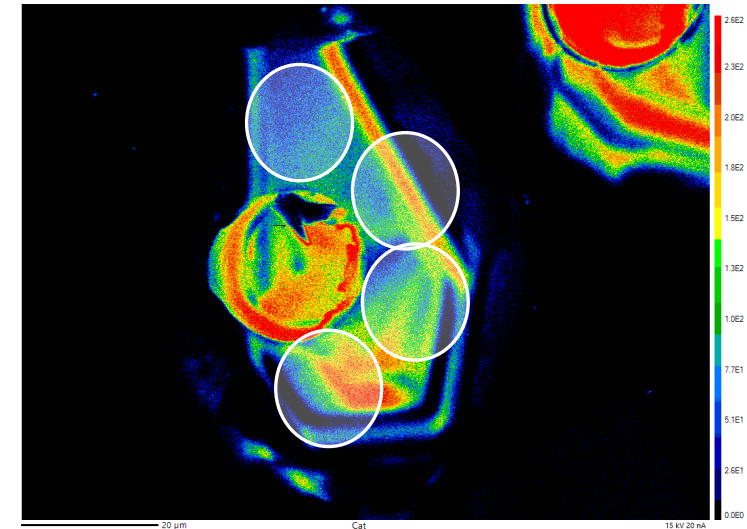
Mixing of Casino Suite core and Prospector Mtn rims?



20 μm

$79.8 \pm 3.6$  Ma (-3.8% disc.)

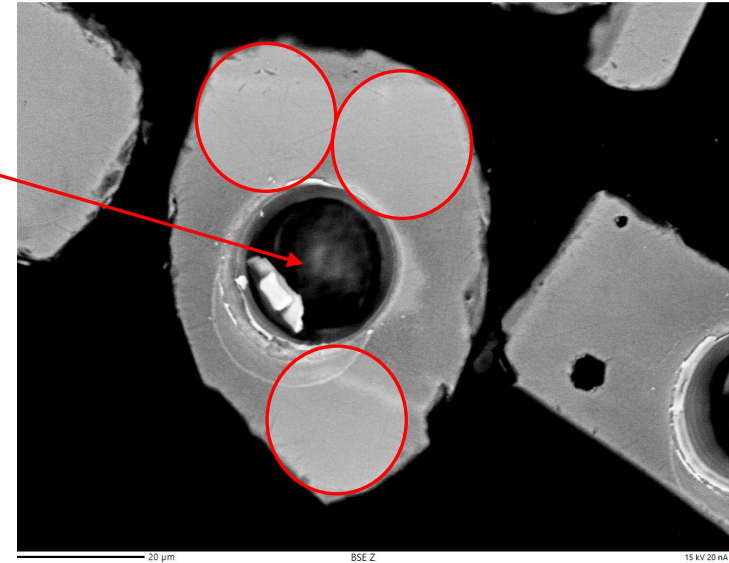
$70.0 \pm 1.7$  Ma (5.4% disc.)



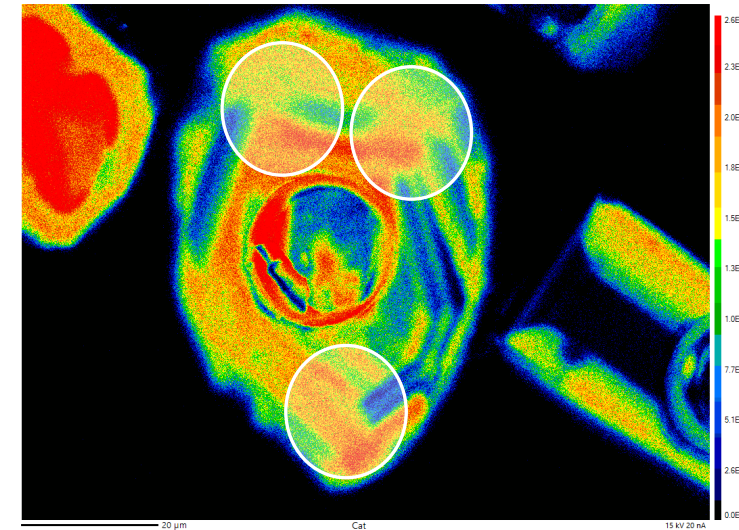
20  $\mu\text{m}$

21JM018B\_12

$66.7 \pm 2.0 \text{ Ma}$  (-3.8% disc.)



Additional spots not analyzed

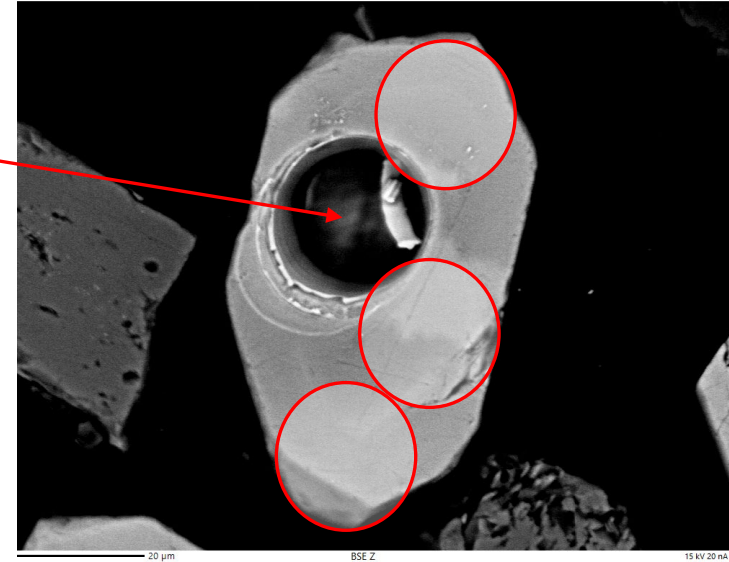




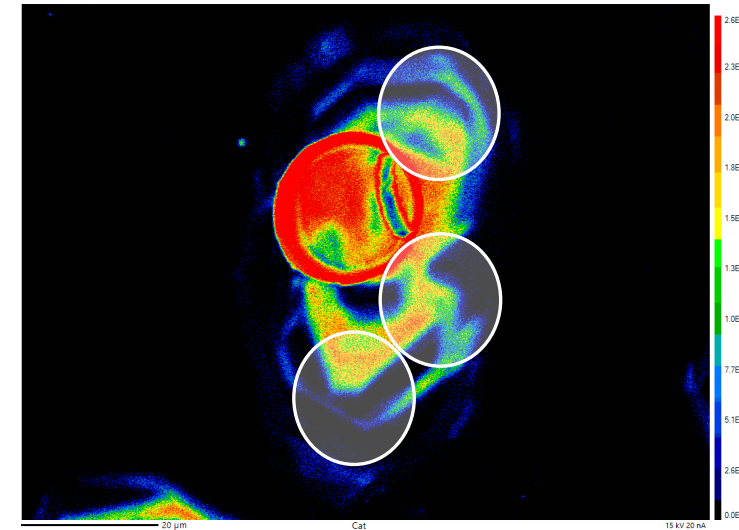
20  $\mu$ m

21JM018B\_26

69.5  $\pm$  2.0 Ma (7.9% disc.)



Additional spots not analyzed



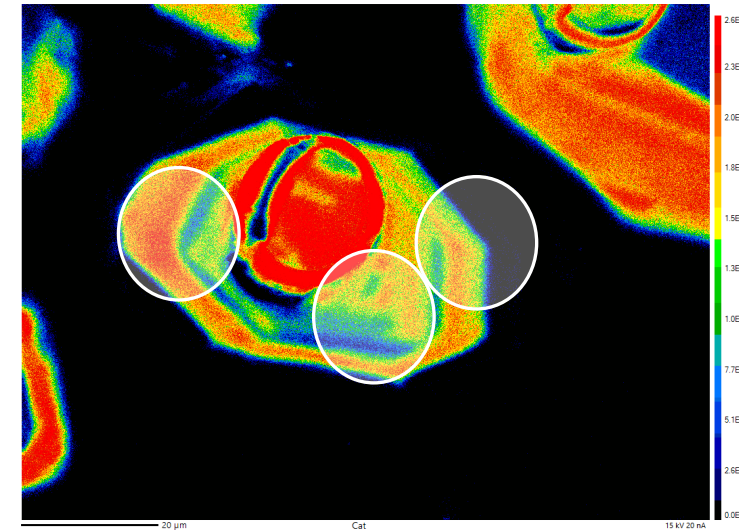
20  $\mu$ m

21JM018B\_30

76.0  $\pm$  3.9 Ma (17.0% disc.)



Additional spots not analyzed



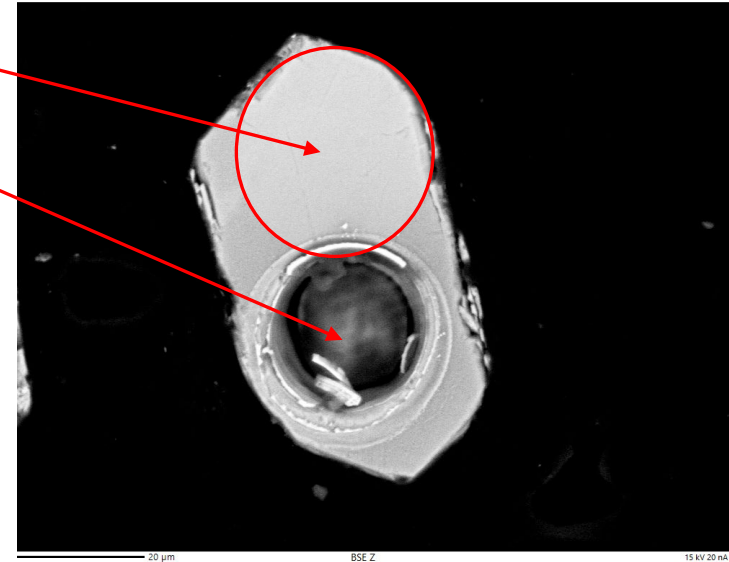
Note dark rim on right

30  $\mu\text{m}$

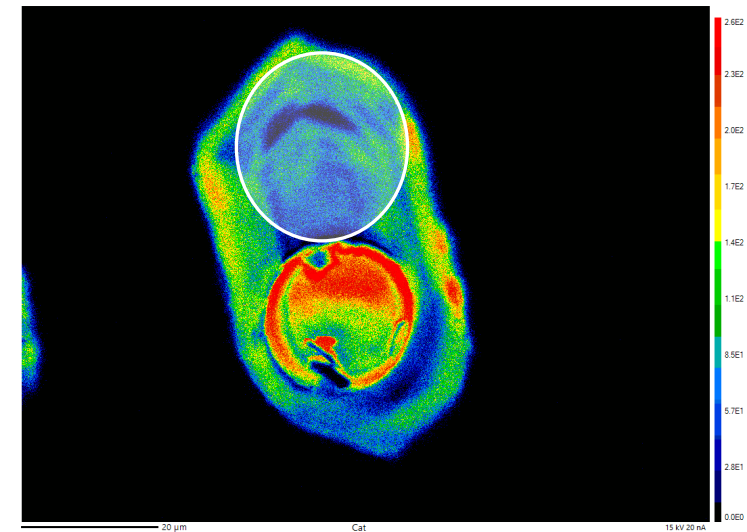
21JM020B\_58

$63.6 \pm 1.1$  Ma (10.6% disc.)

$68.9 \pm 1.6$  Ma (3.9% disc.)



~Prospector Mtn  
Suite



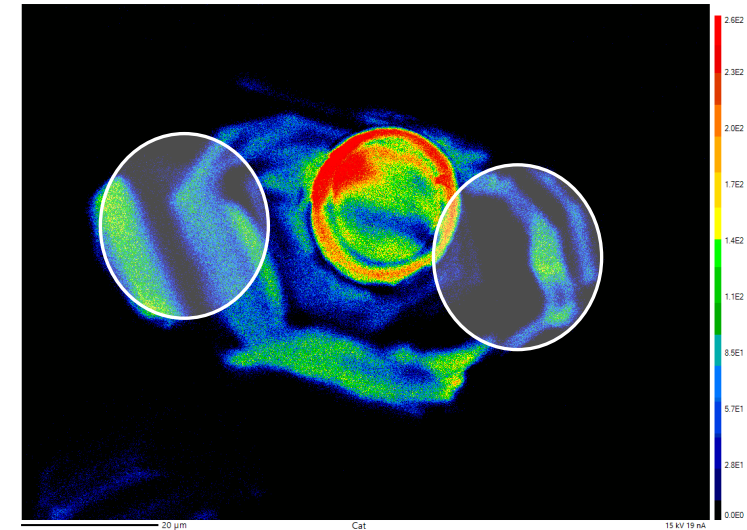
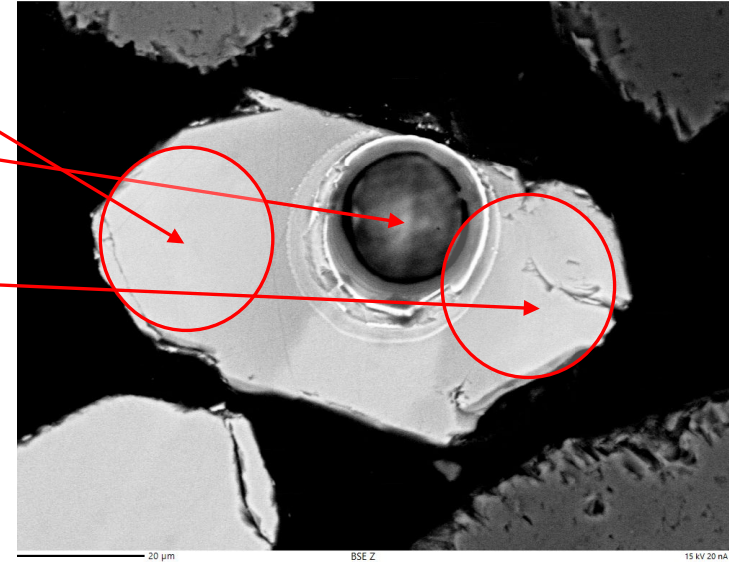
30  $\mu\text{m}$

21JM020B\_113

$56.9 \pm 0.8 \text{ Ma}$  (10.2% disc.)

$64.8 \pm 1.5 \text{ Ma}$  (-11.6% disc.)

$55.3 \pm 1.0 \text{ Ma}$  (14.6% disc.)

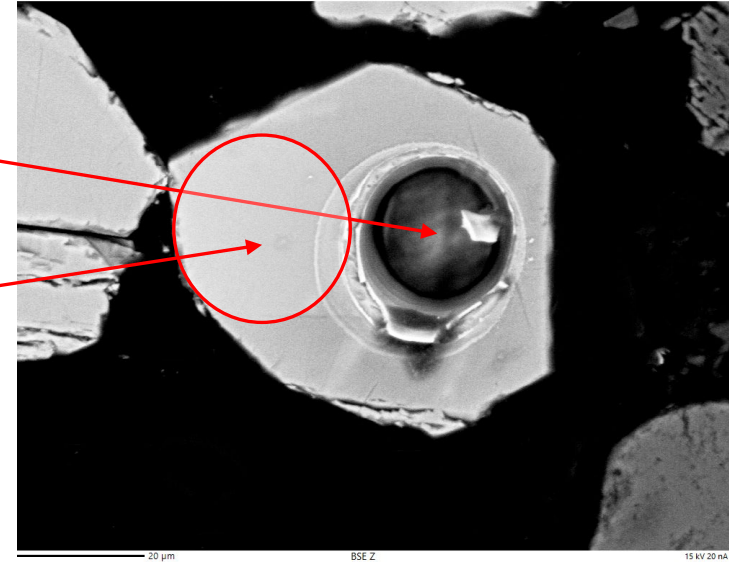


30  $\mu$ m

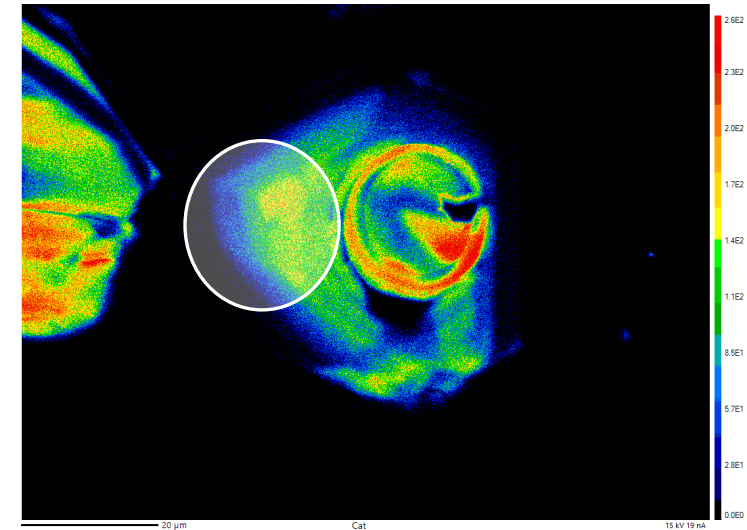
21JM020B\_114

$68.3 \pm 2.8$  Ma (4.8% disc.)

$62.2 \pm 2.2$  Ma (14.9% disc.)



~Prospector Mtn Suite



21JM020B\_119

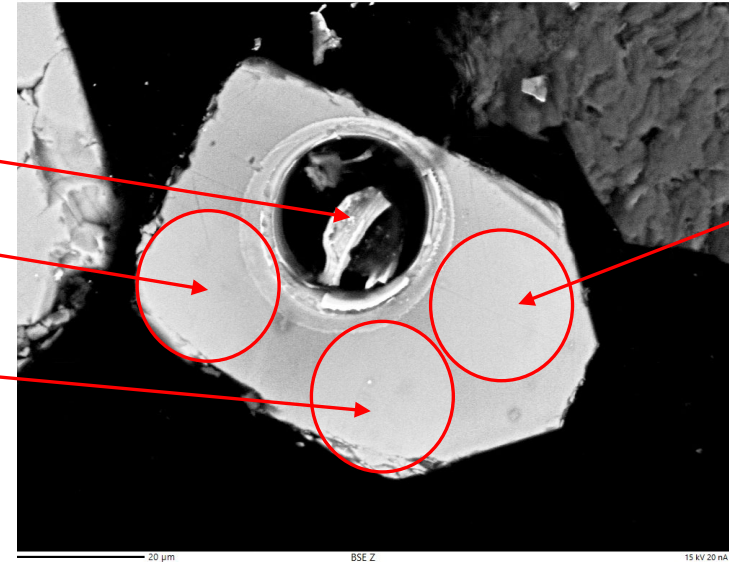
66.0± 1.7 Ma (0.5% disc.)

63.2± 2.7 Ma (0.8% disc.)

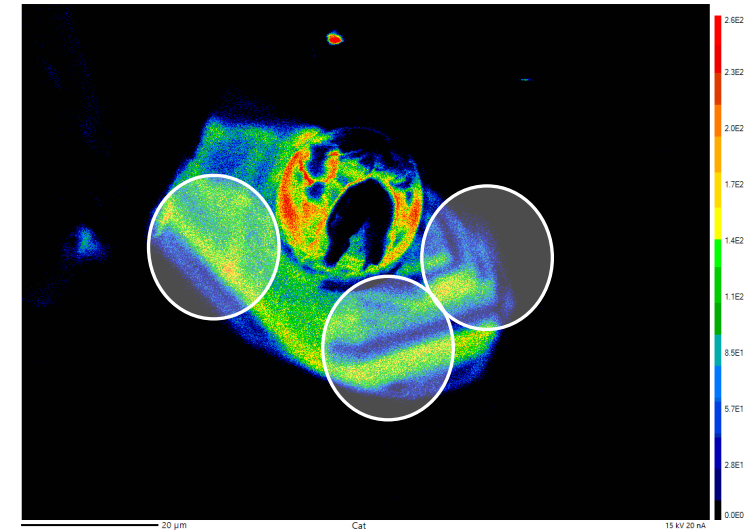
50.8± 1.1 Ma (0.8% disc.)

20 μm

49.8± 1.2 Ma  
(1.7% disc.)



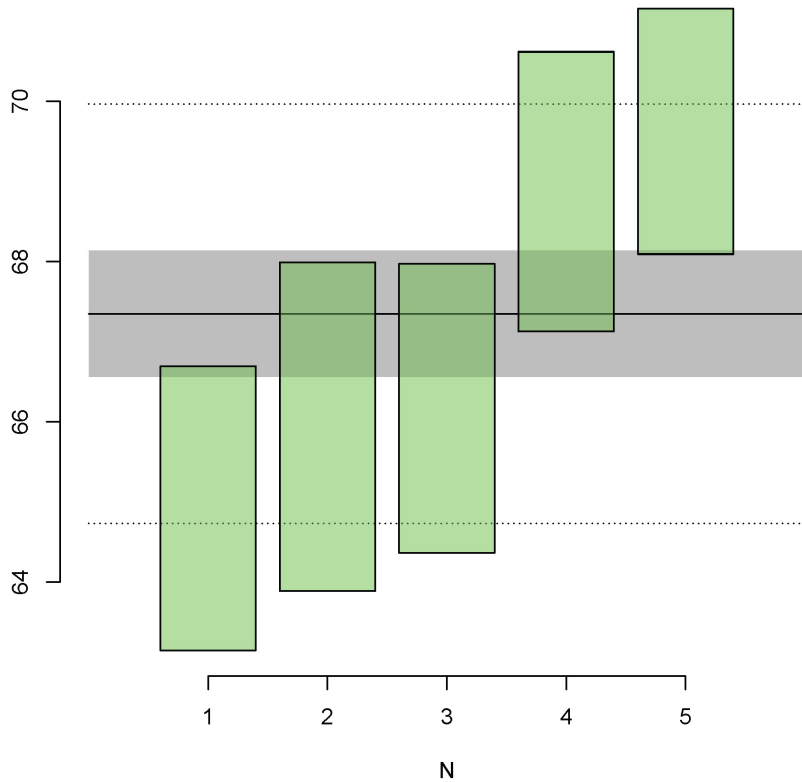
Mixed ages ~ Palaeocene





# 21JM021B\_11

mean =  $67.35 \pm 0.40$  |  $0.79$  |  $2.62$  Ma (n=5/5)  
 MSWD = 5.52,  $p(\chi^2) = 0.00019$

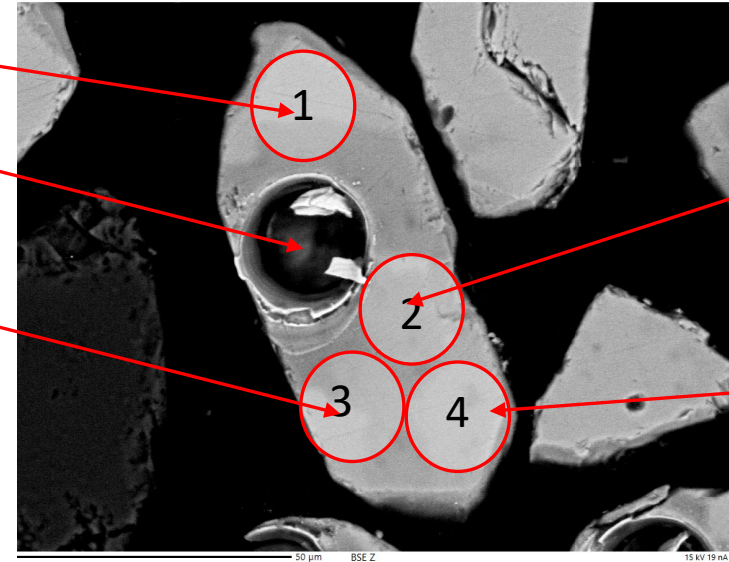


66.2 ± 1.9 Ma (2.1% disc.)

69.5 ± 1.8 Ma (0.5% disc.)

65.9 ± 2.1 Ma (4.2% disc.)

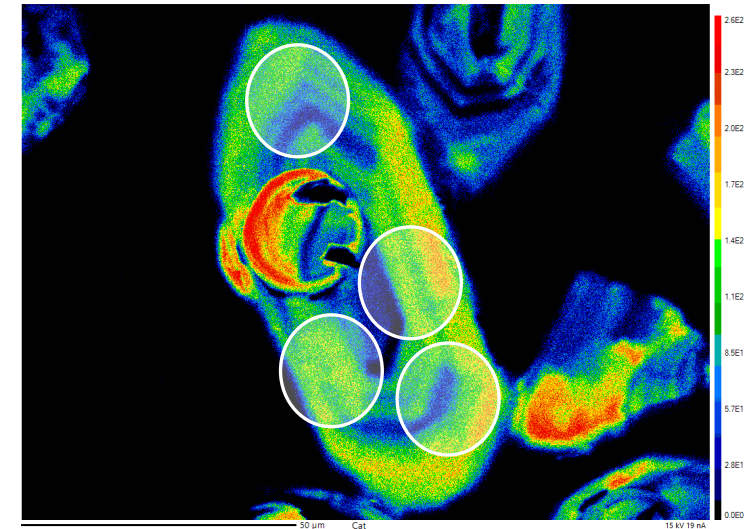
Prospector Mtn  
Suite ~67 Ma



20 μm

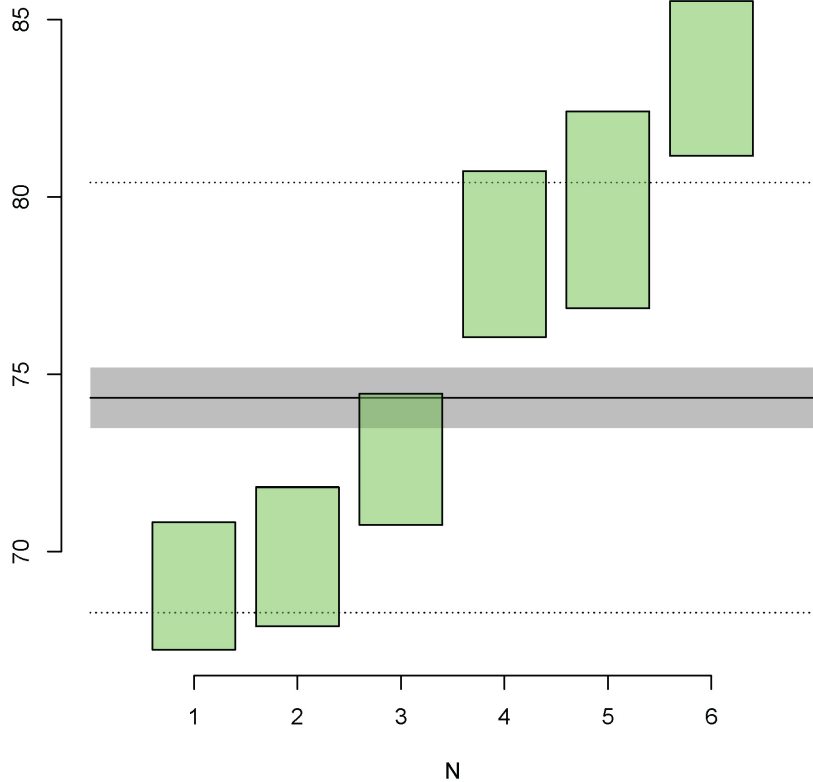
65.0 ± 1.8 Ma  
(-3.7% disc.)

69.2 ± 1.8 Ma  
(-8.9% disc.)



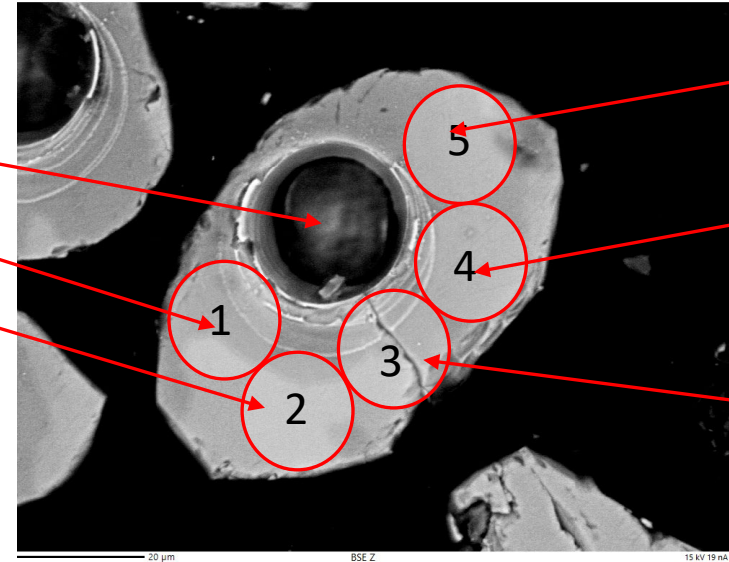
21JM021B\_13

mean =  $74.34 \pm 0.43$  | 0.85 | 6.07 Ma (n=6/6)  
MSWD = 29.6,  $p(\chi^2) = 0$



$70.2 \pm 1.9$  Ma (-1.0% disc.)  
 $72.3 \pm 1.9$  Ma (-2.3% disc.)  
 $79.6 \pm 2.8$  Ma (-9.9% disc.)

Inconsistent ages but all broadly Casino Suite

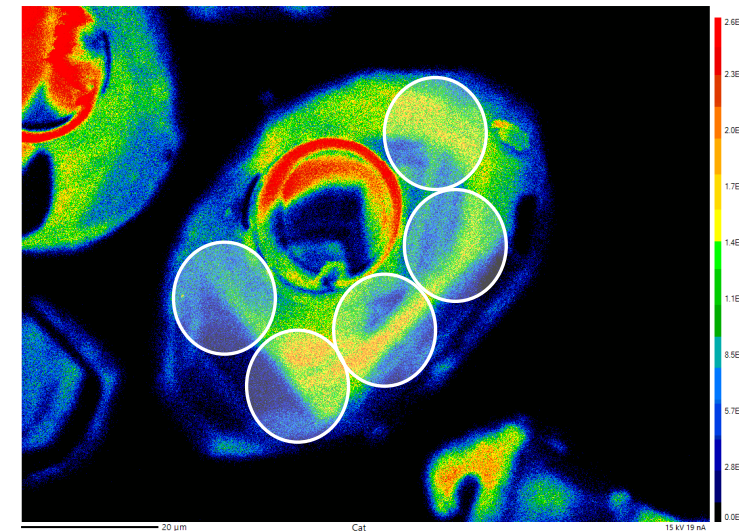


20 µm

$69.0 \pm 2.0$  Ma  
(15.9% disc.)

$83.4 \pm 2.3$  Ma  
(6.8% disc.)

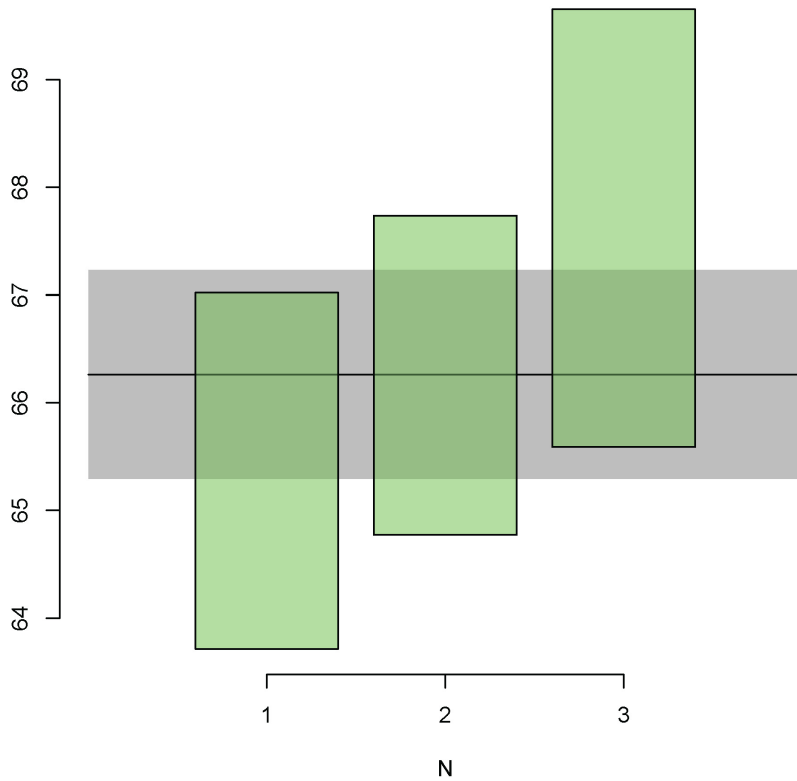
$78.4 \pm 2.5$  Ma  
(13.9% disc.)



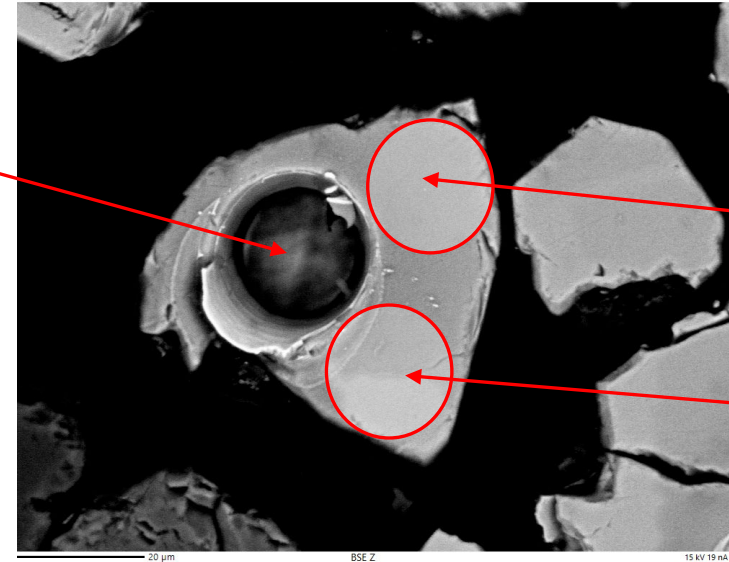


# 21JM021B\_18

mean =  $66.26 \pm 0.49$  | 0.97 Ma (n=3/3)  
MSWD = 1.42,  $p(\chi^2) = 0.24$



$68.3 \pm 2.2$  Ma (3.9% disc.)

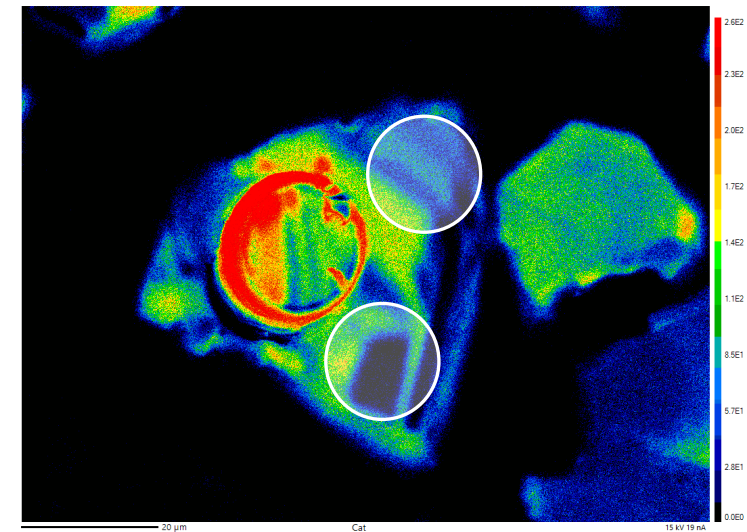


20  $\mu$ m

$65.4 \pm 1.7$  Ma  
(3.5% disc.)

$66.2 \pm 1.5$  Ma  
(4.9% disc.)

~66 Ma Prospector  
Mtn Suite

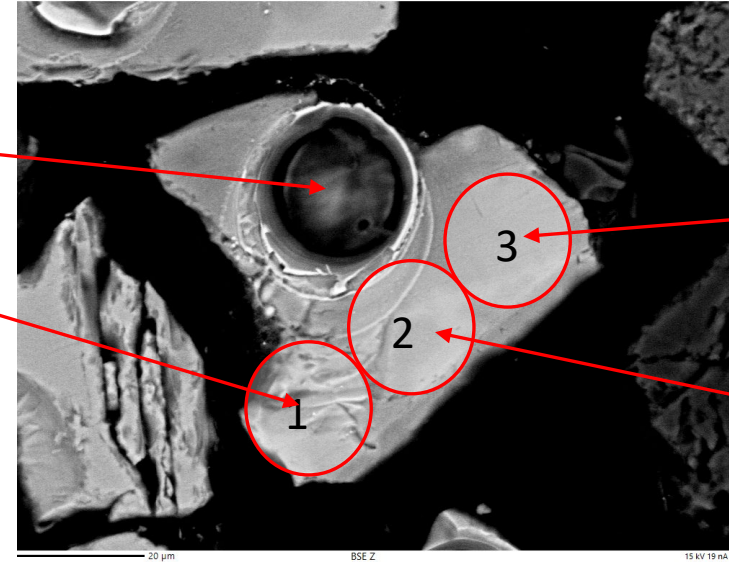


21JM021B\_21

65.2± 1.8 Ma (-1.2% disc.)

58.5± 1.2 Ma (17.8% disc.)

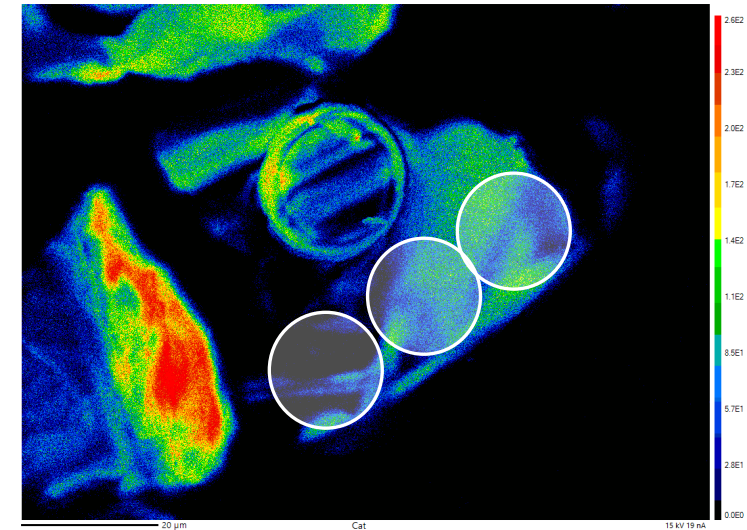
20 μm



57.6± 1.4 Ma  
(9.5% disc.)

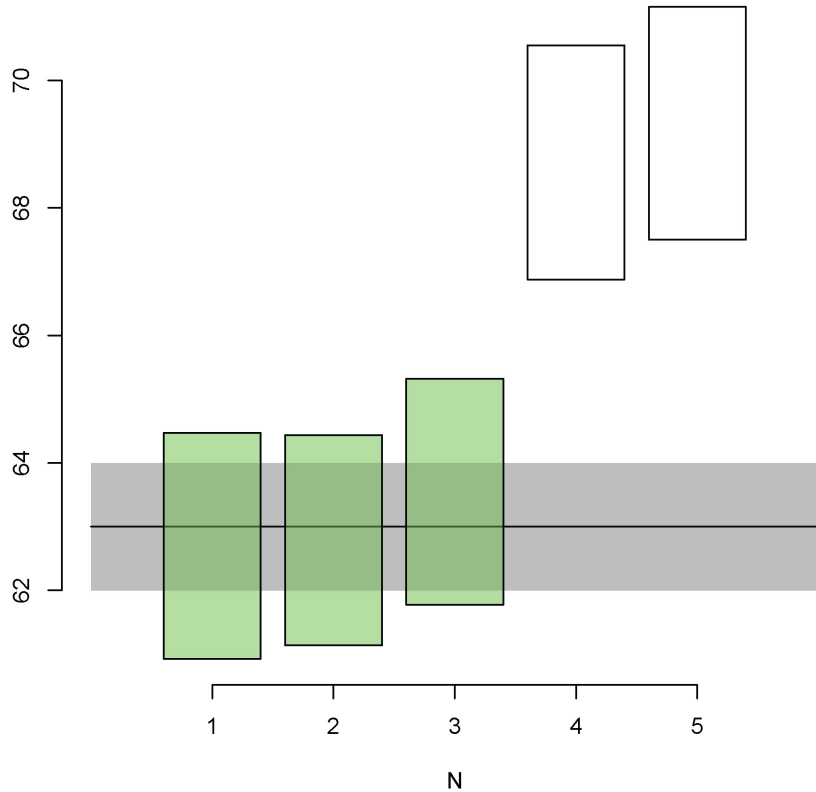
63.1± 1.5 Ma  
(4.5% disc.)

~Palaeocene age



21JM021B\_28

mean =  $63.00 \pm 0.51$  | 1.00 Ma (n=3/5)  
 MSWD = 0.27,  $p(\chi^2) = 0.76$

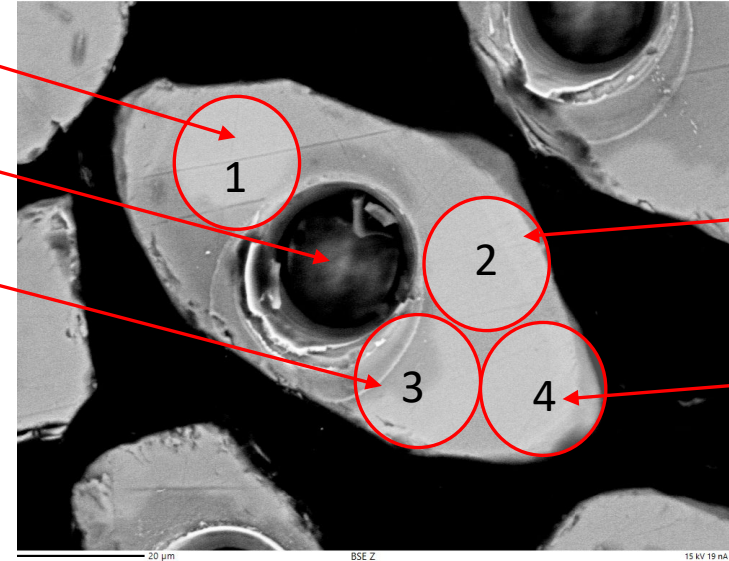


$69.3 \pm 1.9$  Ma (-0.4% disc.)

$69.1 \pm 1.9$  Ma (0.0% disc.)

$63.5 \pm 1.9$  Ma (17.6% disc.)

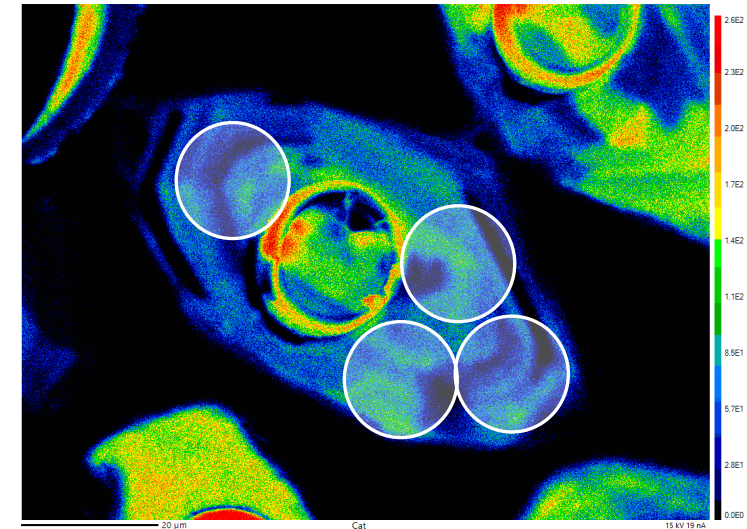
Two older core ages and three ~63 Ma rim ages



20 µm

$62.7 \pm 1.8$  Ma  
(1.9% disc.)

$62.8 \pm 1.7$  Ma  
(4.3% disc.)

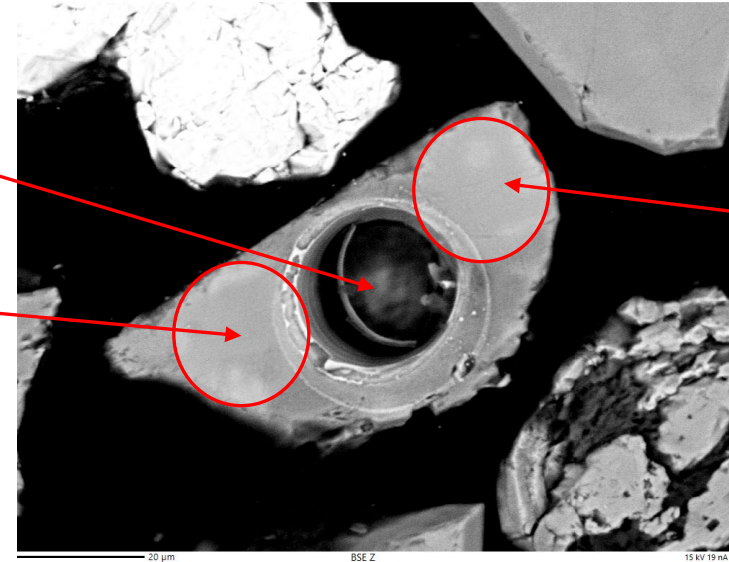


21JM021B\_40

$64.4 \pm 1.3$  Ma (-4.4% disc.)

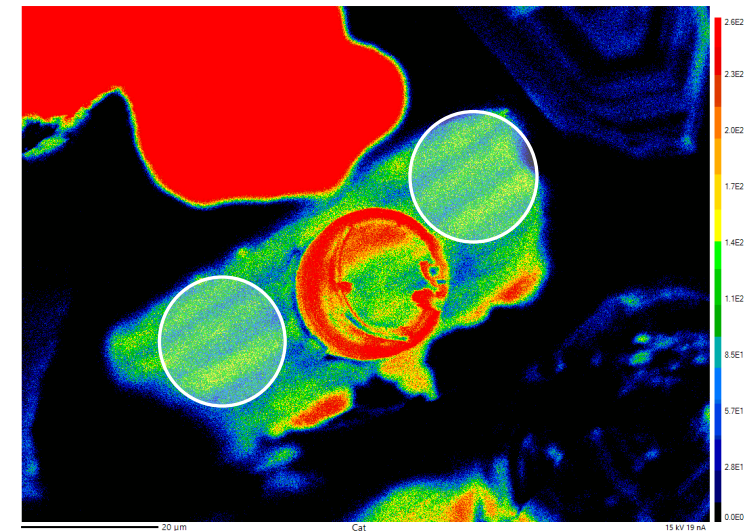
$61.2 \pm 1.8$  Ma (2.4% disc.)

20  $\mu$ m



$62.3 \pm 1.8$  Ma  
(0.6% disc.)

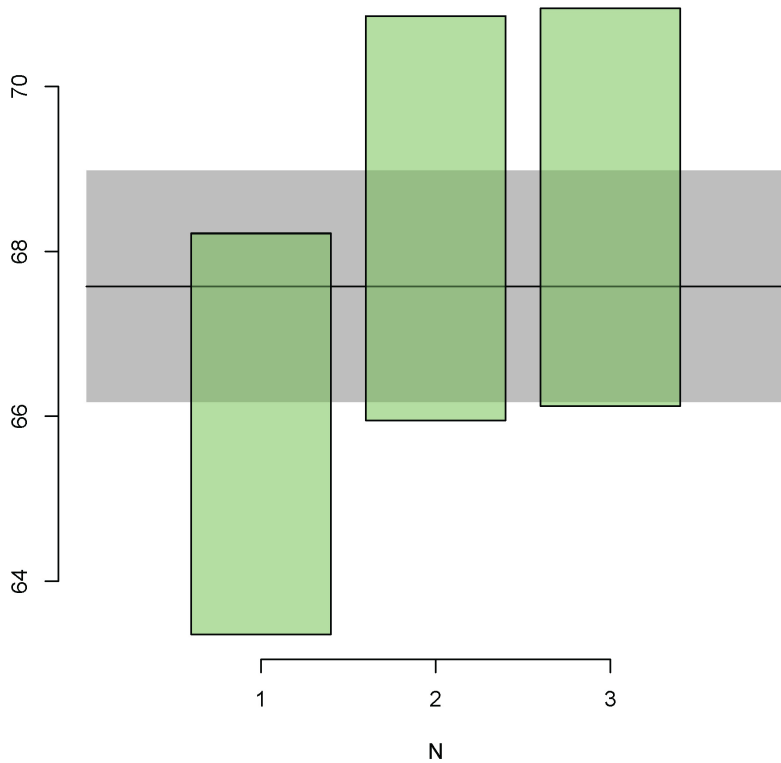
~62 Ma age





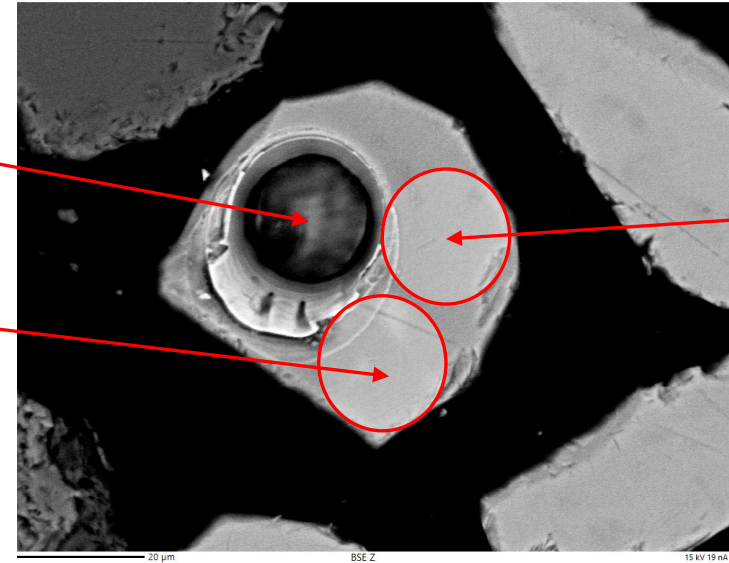
21JM021B\_45

mean =  $67.58 \pm 0.72$  | 1.40 Ma (n=3/3)  
MSWD = 1.56,  $p(\chi^2) = 0.21$



$69.7 \pm 2.8$  Ma (20.7% disc.)

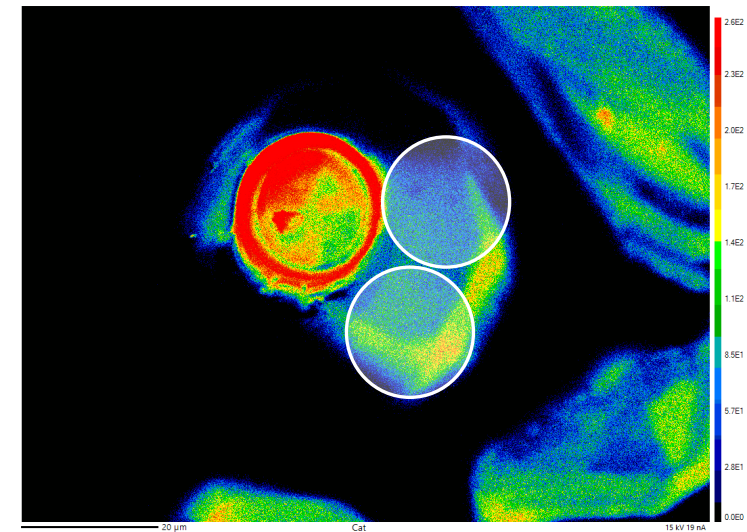
$68.4 \pm 2.5$  Ma (8.5% disc.)



20 μm

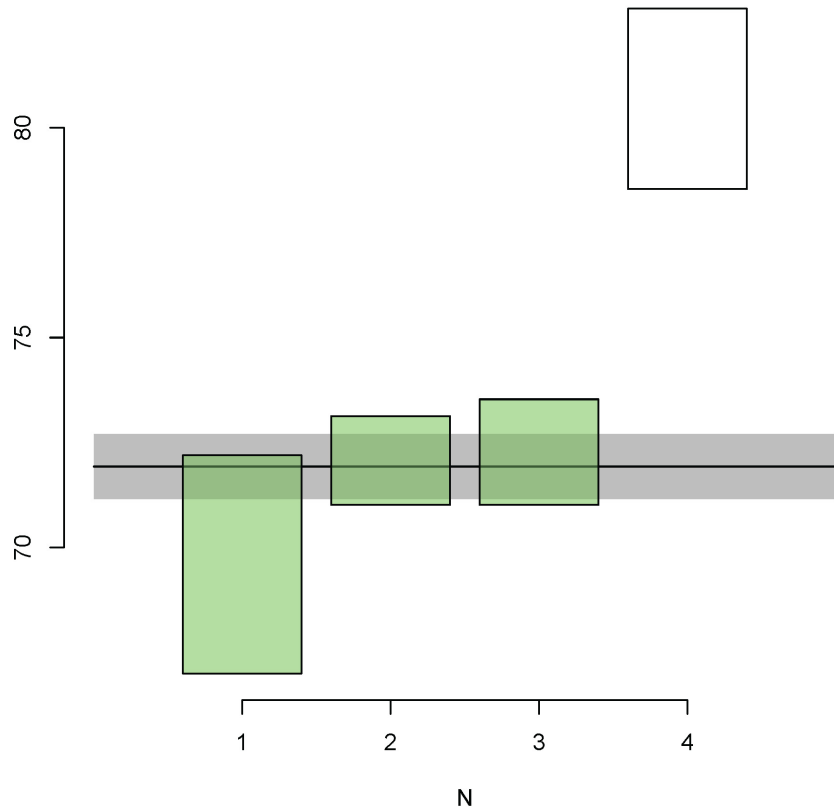
$65.8 \pm 2.6$  Ma  
(3.1% disc.)

~67 Ma  
Prospector Mtn  
Suite



# 21JM023B\_10

mean =  $71.93 \pm 0.39$  | 0.77 Ma (n=3/4)  
MSWD = 1.72,  $p(\chi^2) = 0.18$

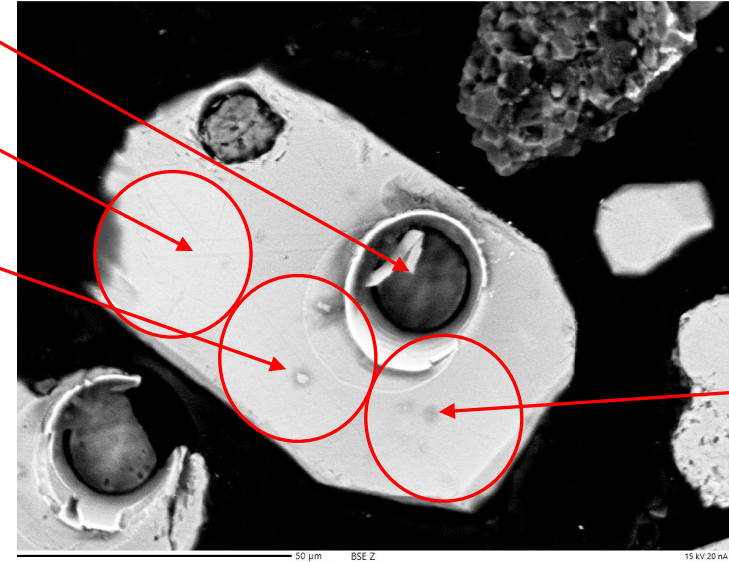


$71.0 \pm 2.7$  Ma (12.2% disc.)

$71.9 \pm 1.1$  Ma (-1.7% disc.)

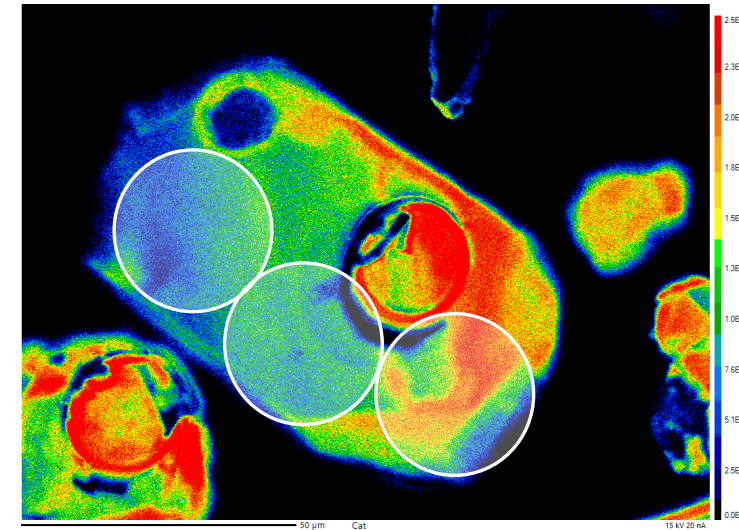
$80.7 \pm 2.3$  Ma (27.2% disc.)

~72 Ma Casino Suite (high discordance age omitted)



30  $\mu$ m

$72.3 \pm 1.3$  Ma (11.2% disc.)



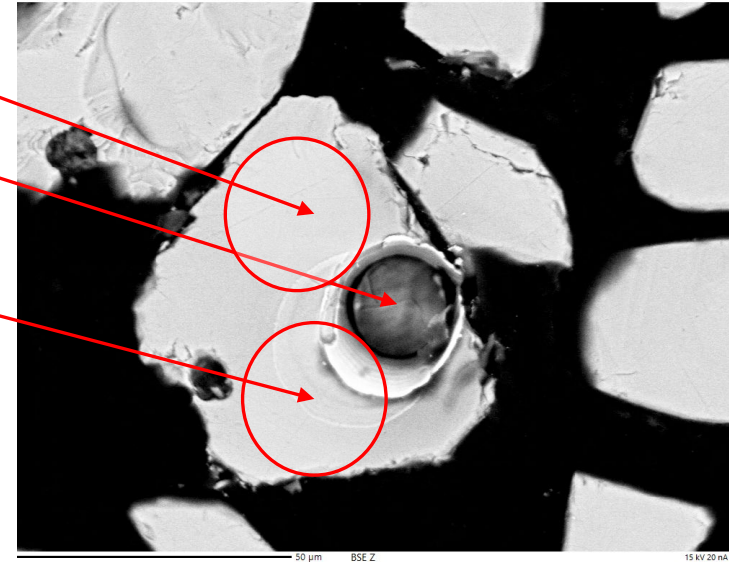
30  $\mu\text{m}$

21JM023B\_25

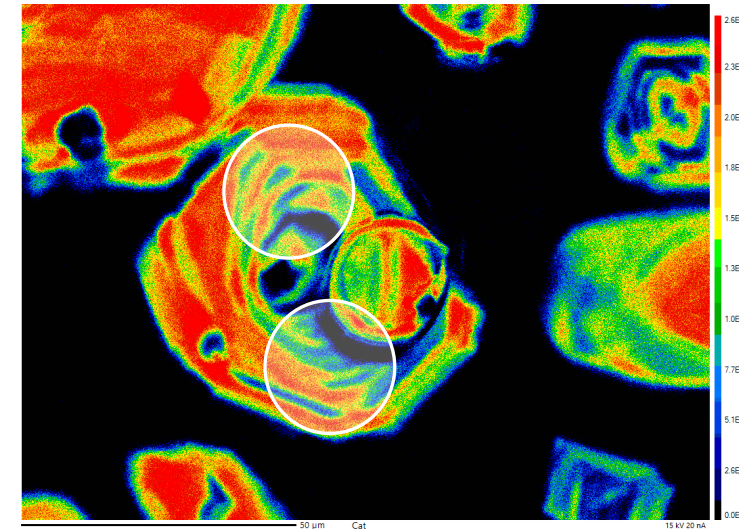
98.9 $\pm$  1.9 Ma (1.9% disc.)

64.4 $\pm$  1.2 Ma (0.1% disc.)

94.5 $\pm$  1.7 Ma (17.4% disc.)



Inconsistent ages. Likely sample mix up/mislabel between analytical sessions.



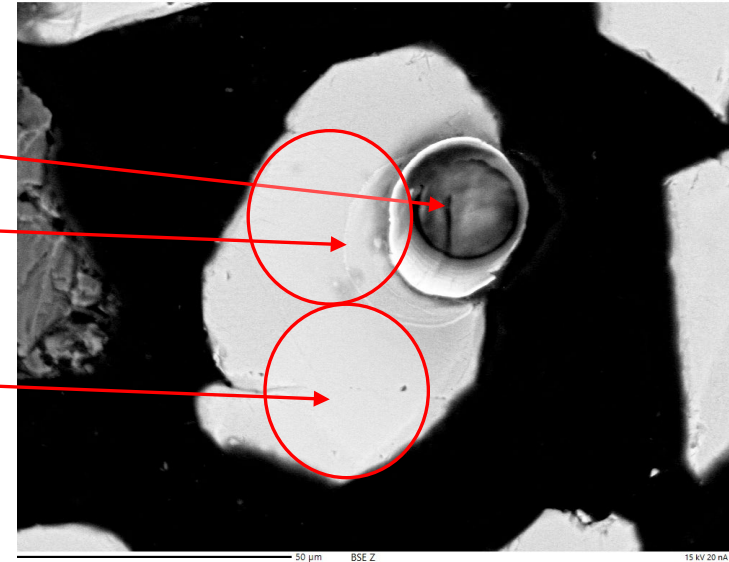
30  $\mu\text{m}$

21JM023B\_27

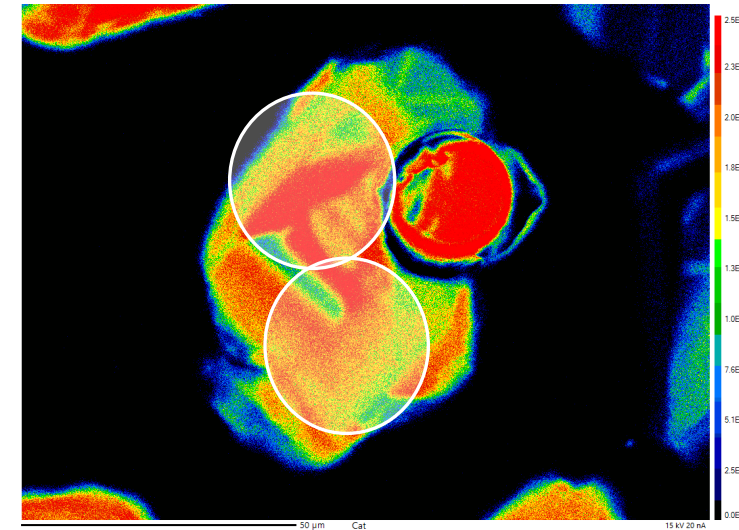
$63.2 \pm 1.7$  Ma (7.1% disc.)

$106.6 \pm 1.7$  Ma (-2.8% disc.)

$112.1 \pm 1.8$  Ma (1.7% disc.)



Inconsistent ages. Likely sample mix up/mislabel between analytical sessions.



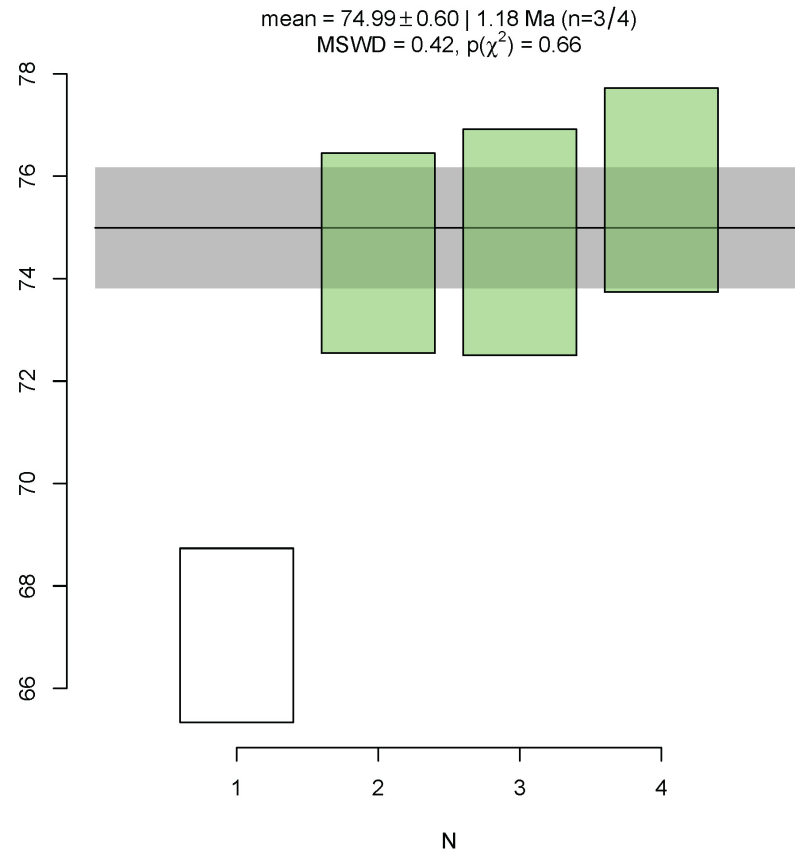


# 21JM023B\_78

No images acquired.

Casino Suite Age.

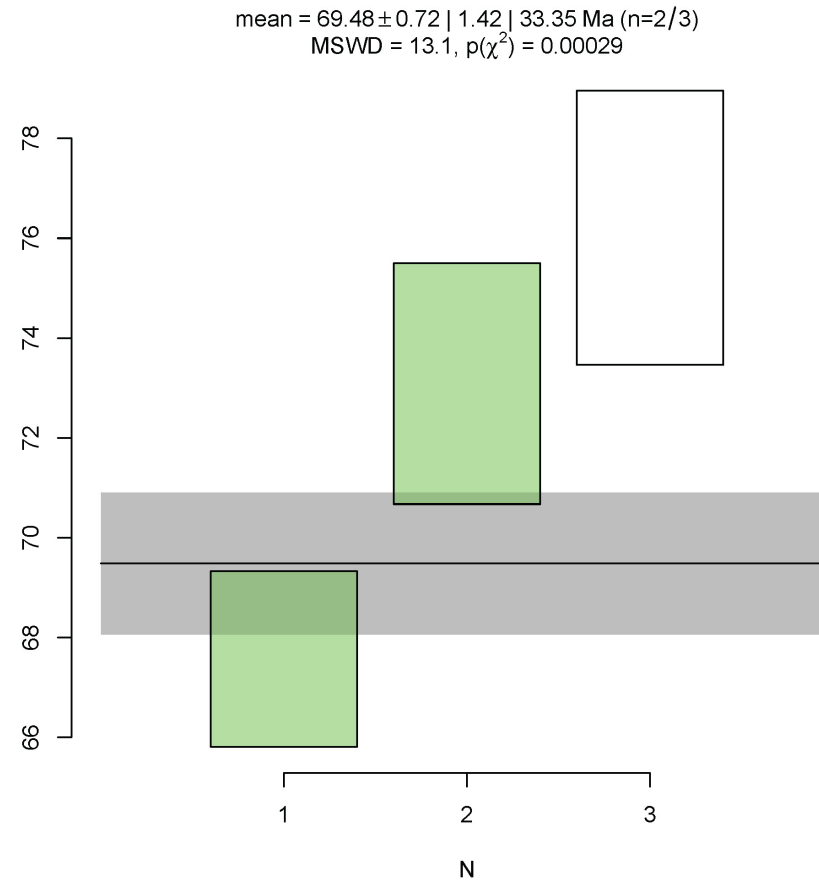
First analytical session gave anomalous younger age of ~67 Ma



# 21JM023B\_85

No images acquired.

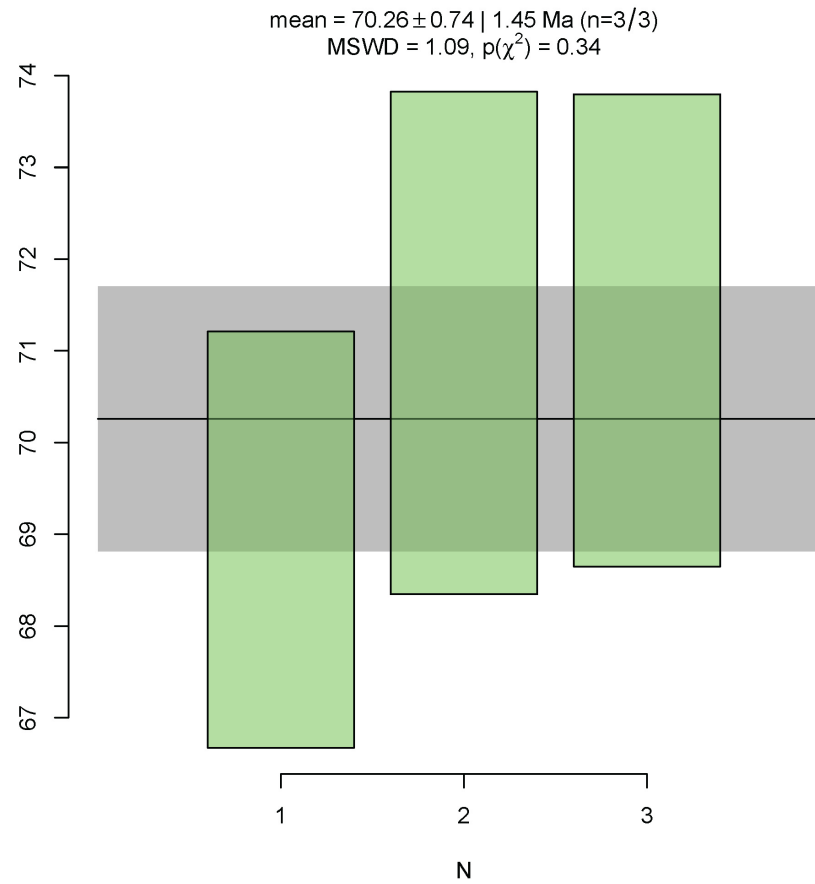
~69 Ma age Prospector Mtn Suite with a  
Casino Suite age



# 21JM023B\_91

No images acquired.

Casino Suite ~70 Ma age

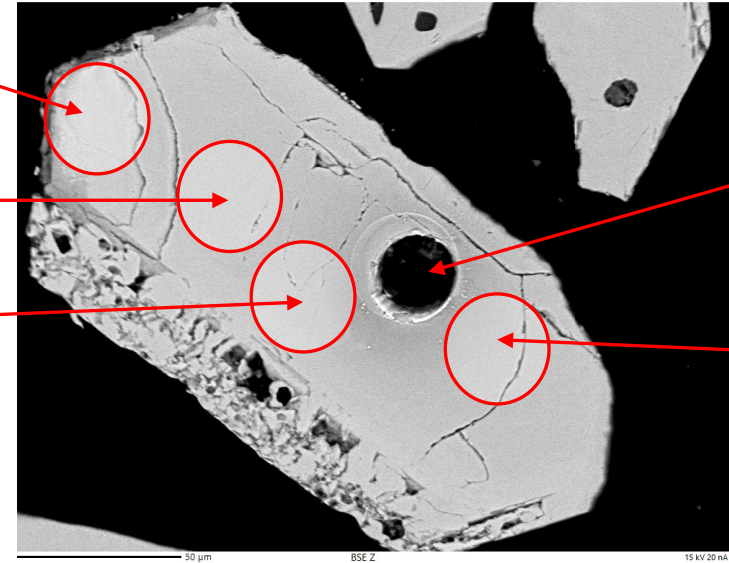


21JM024B\_02

95.9± 2.2 Ma (49% disc.)

81.6± 3.8 Ma (54.1% disc.)

84.8± 1.8 Ma (43.3% disc.)

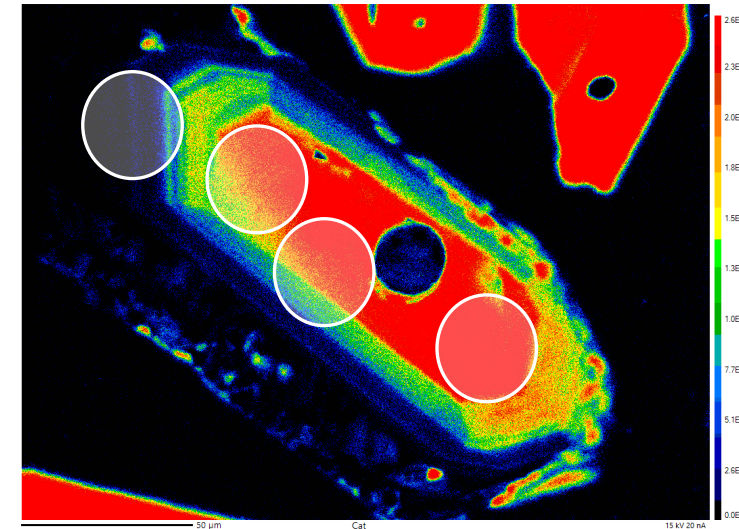


30 μm

75.0± 4.0 Ma  
(54.7% disc.)

86.1± 2.7 Ma  
(46.9% disc.)

Highly discordant and  
inconsistent ages.  
Disregard.



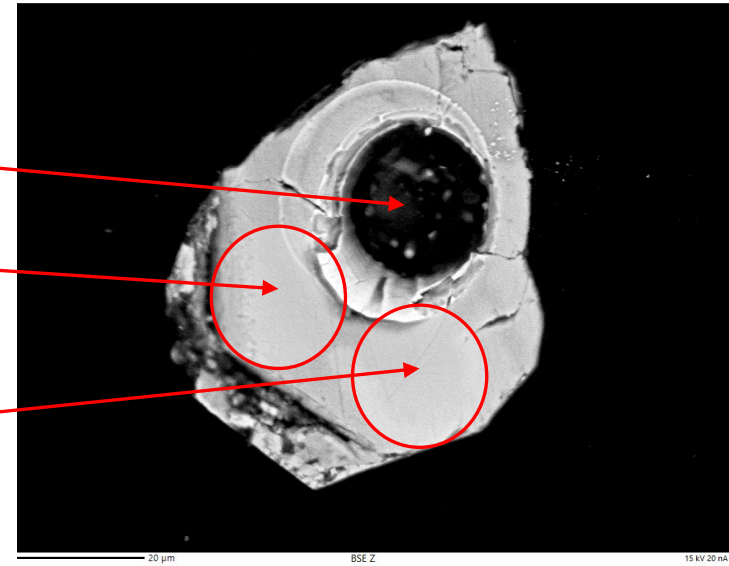
20  $\mu$ m

21JM024B\_61

75.0 $\pm$  2.4 Ma (67.6% disc.)

103.1 $\pm$  1.9 Ma (5.4% disc.)

101.8 $\pm$  2.2 Ma (0.1% disc.)



New ages are concordant and show the grain  
To be Dawson Range Batholith

