

Elements

part two

Winston Ingram

Few would disagree that the Periodic Table of Chemical Elements is one of the most significant achievements in science, capturing, as it does, the essence not only of chemistry, but also of physics and biology. And it just so happens that 2019 marks 150 years since Russian chemist Dmitrii Ivanovich Mendeleev created his table, with its symbols and numbers revealing the atomic relationships between the known chemical elements and enabling predictions to be made about the existence of as-yet undiscovered elements.

To celebrate this landmark anniversary, regular infocus contributor Winston Ingram set about capturing exciting images of no fewer than 85 different elements, using a wide range of different microscopical techniques.

We are very pleased to include a selection of these images in the second and concluding part of this special tribute to Mendeleev's unique achievement: The Periodic Table.



"I have taken a selection of 85 different elements at sizes of between 0.05mm to 3cm and using magnifications of 2x to 200x.

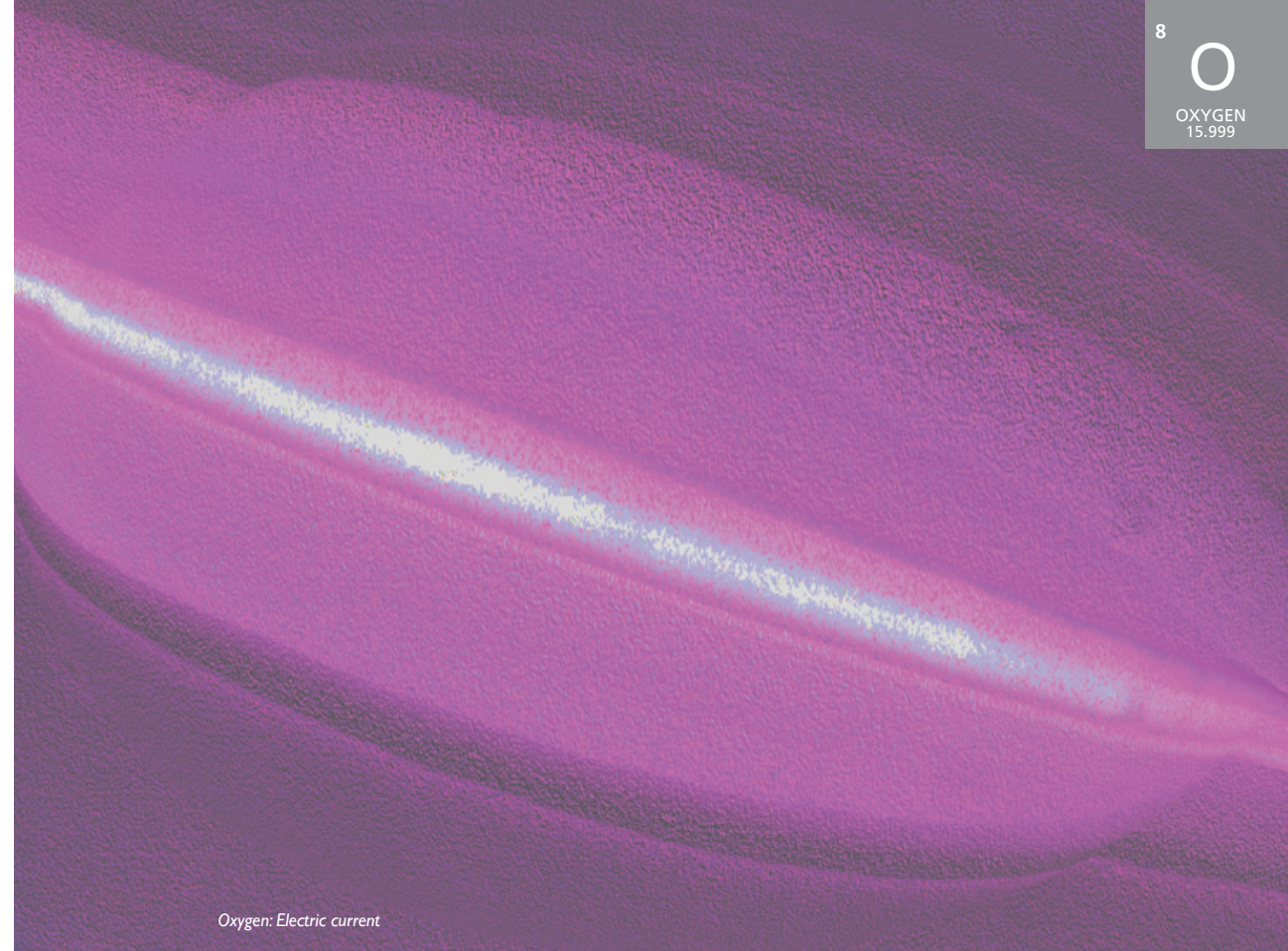
I photographed them with a large variety of techniques in both single and multiple forms to colour the subjects.

These techniques include polarisation, brightfield, darkfield, phase contrast, DIC, Hoffman modulation contrast, Rheinberg filters, and one microscope fitted with a Heine condenser.

To enable me to excite the gases, I used three different circuits I built to allow current to pass through the glass tubes containing the gases, and I also used radio waves and radioactivity.

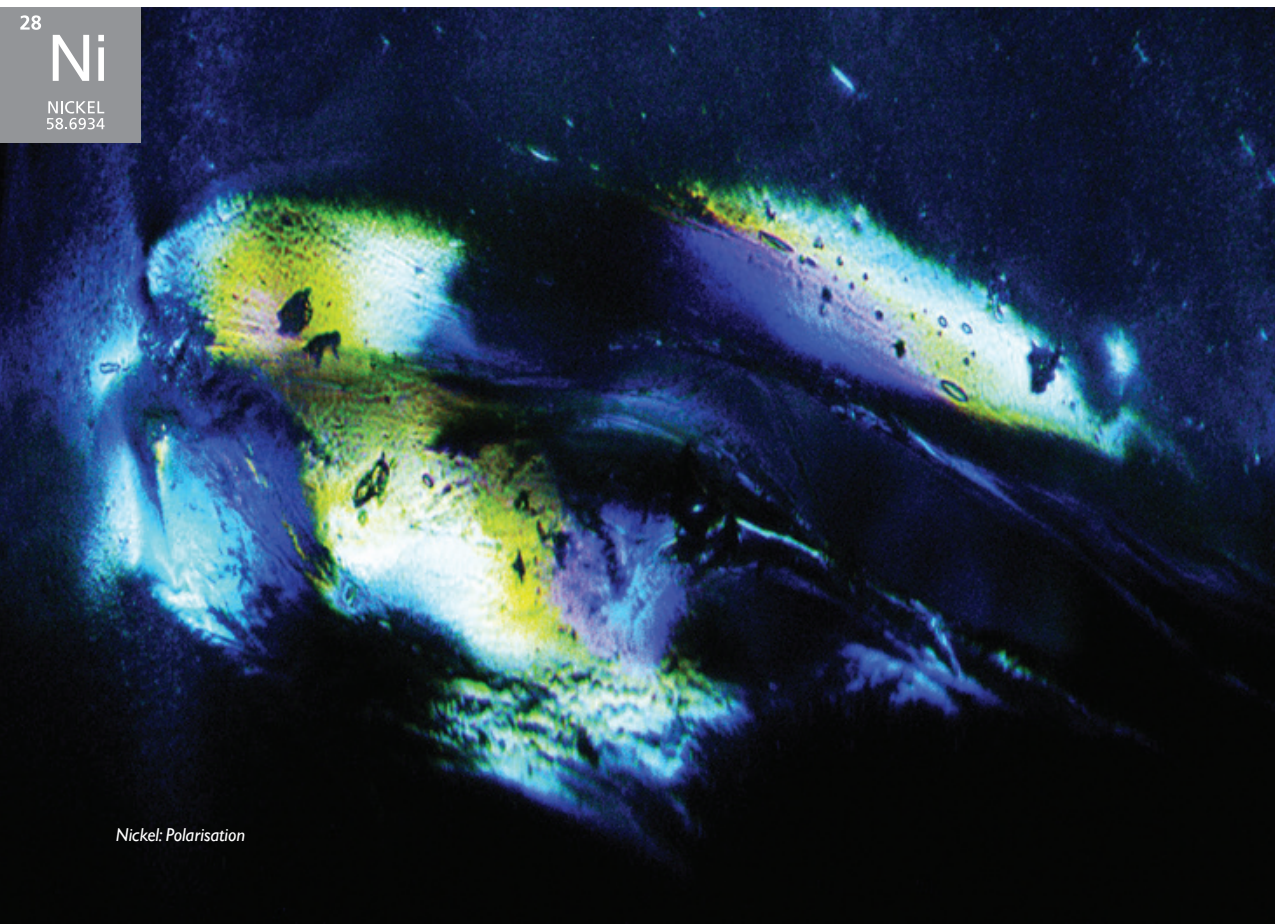
I made 3" x 1" standard microscope slides for some of the samples; others were used as supplied in small pieces.

To obtain some effects I used a thermal imaging technique so I could photograph the heat signatures of the subject, shown up in various colours."



Oxygen: Electric current

8
O
OXYGEN
15.999



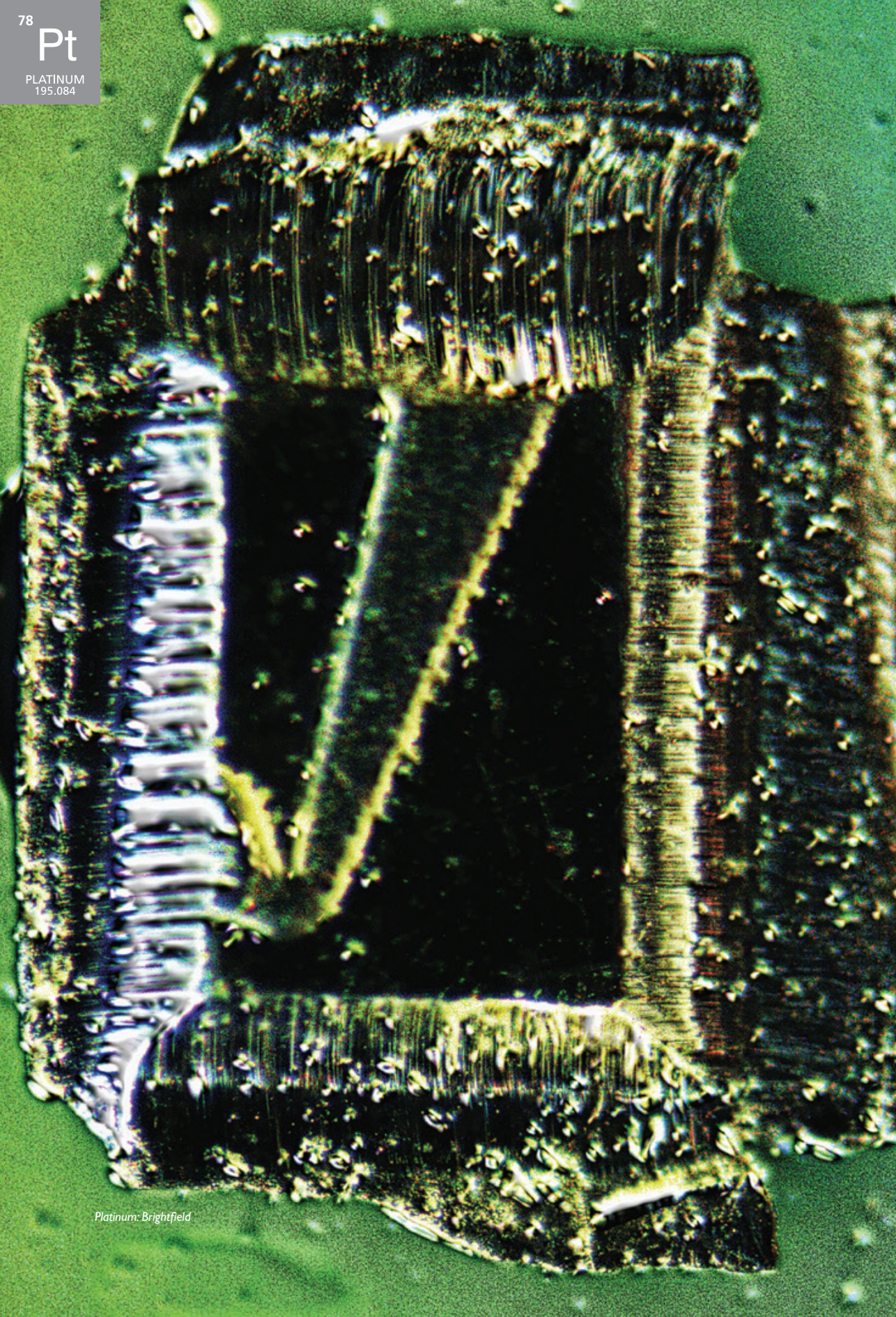
Nickel: Polarisation

28
Ni
NICKEL
58.6934



Phosphorus: Thermal imaging

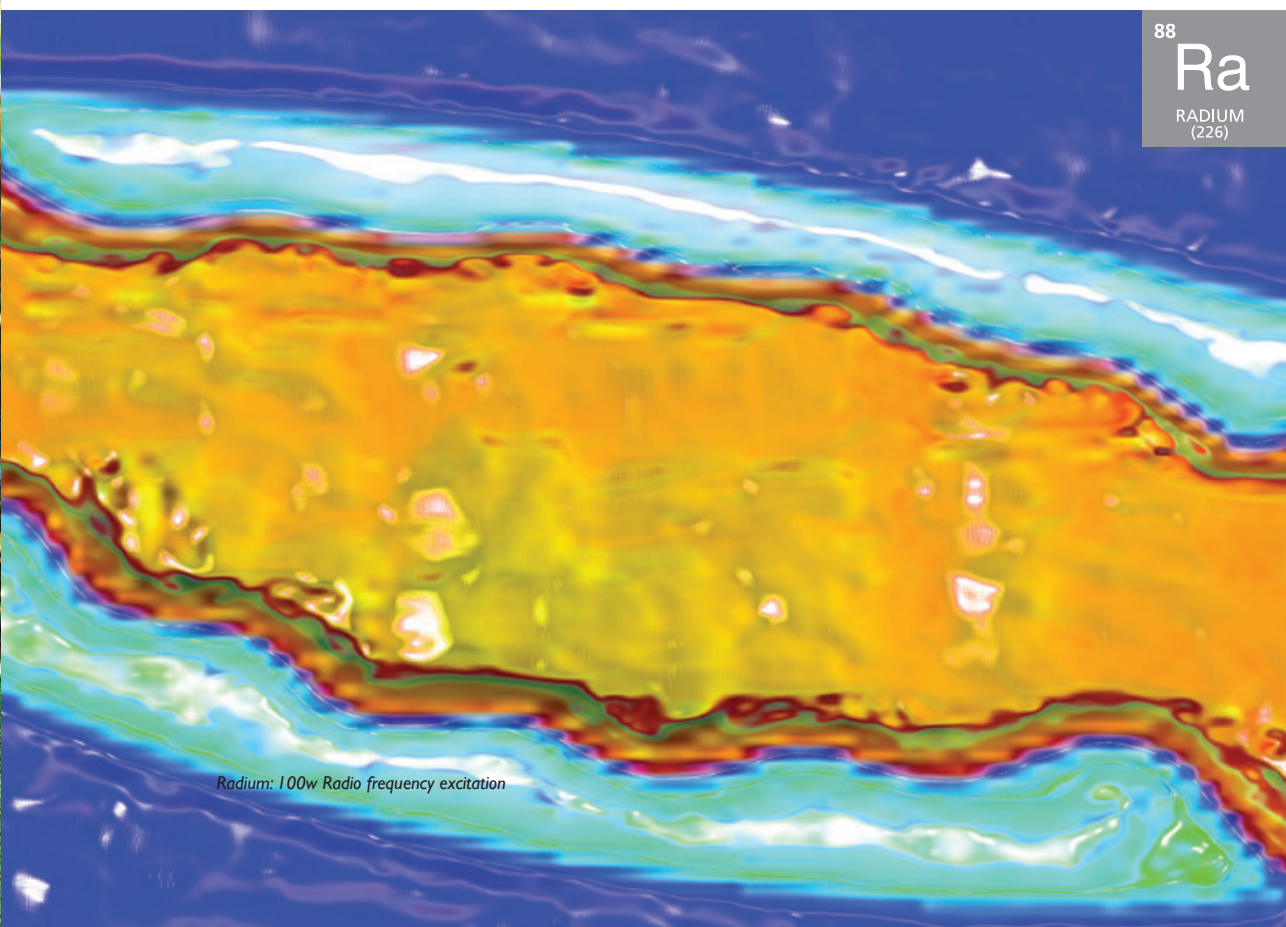
15
P
PHOSPHORUS
30.974



Platinum: Brightfield



Promethium: Darkfield

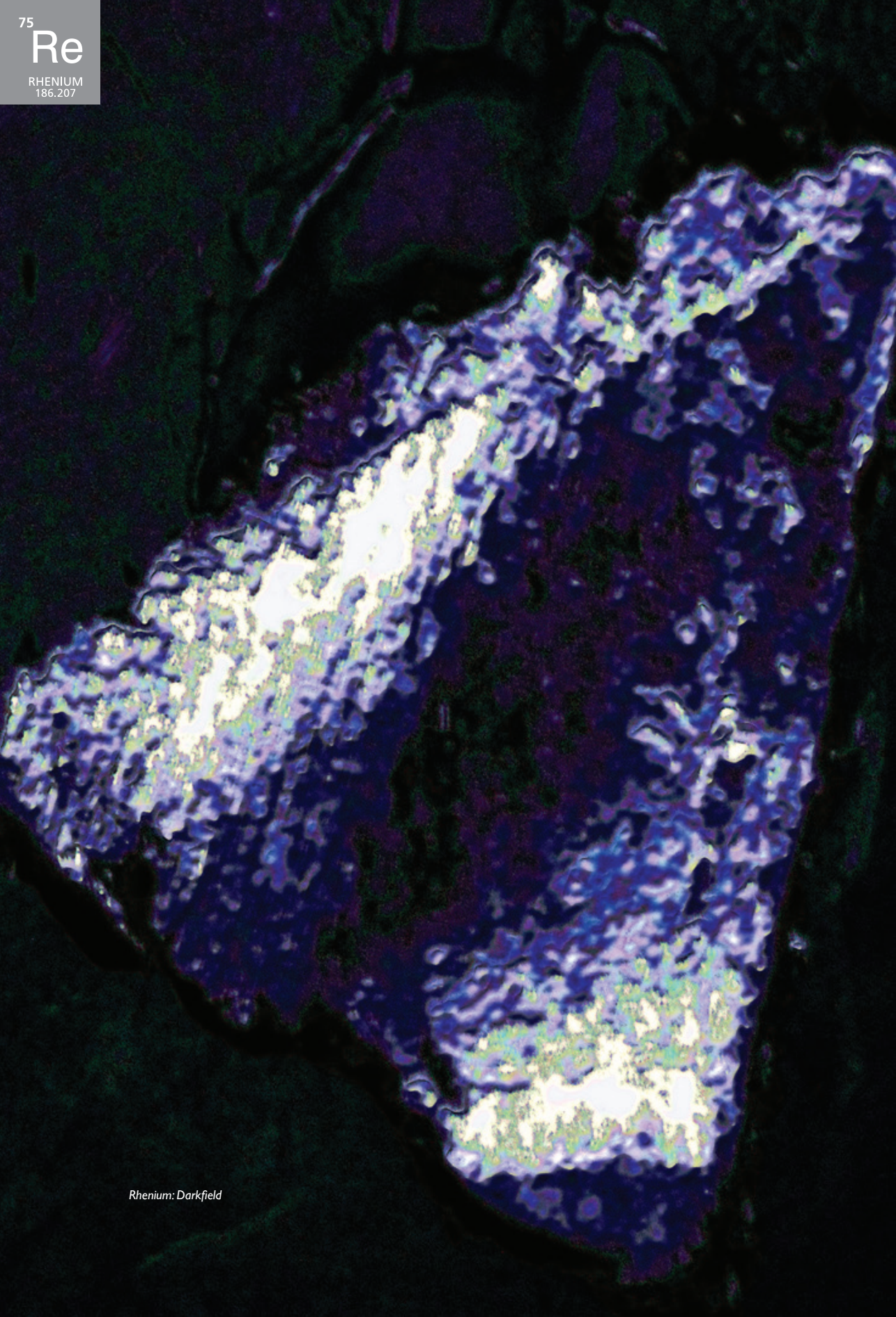


Radium: 100w Radio frequency excitation

75

Re

RHENIUM
186.207

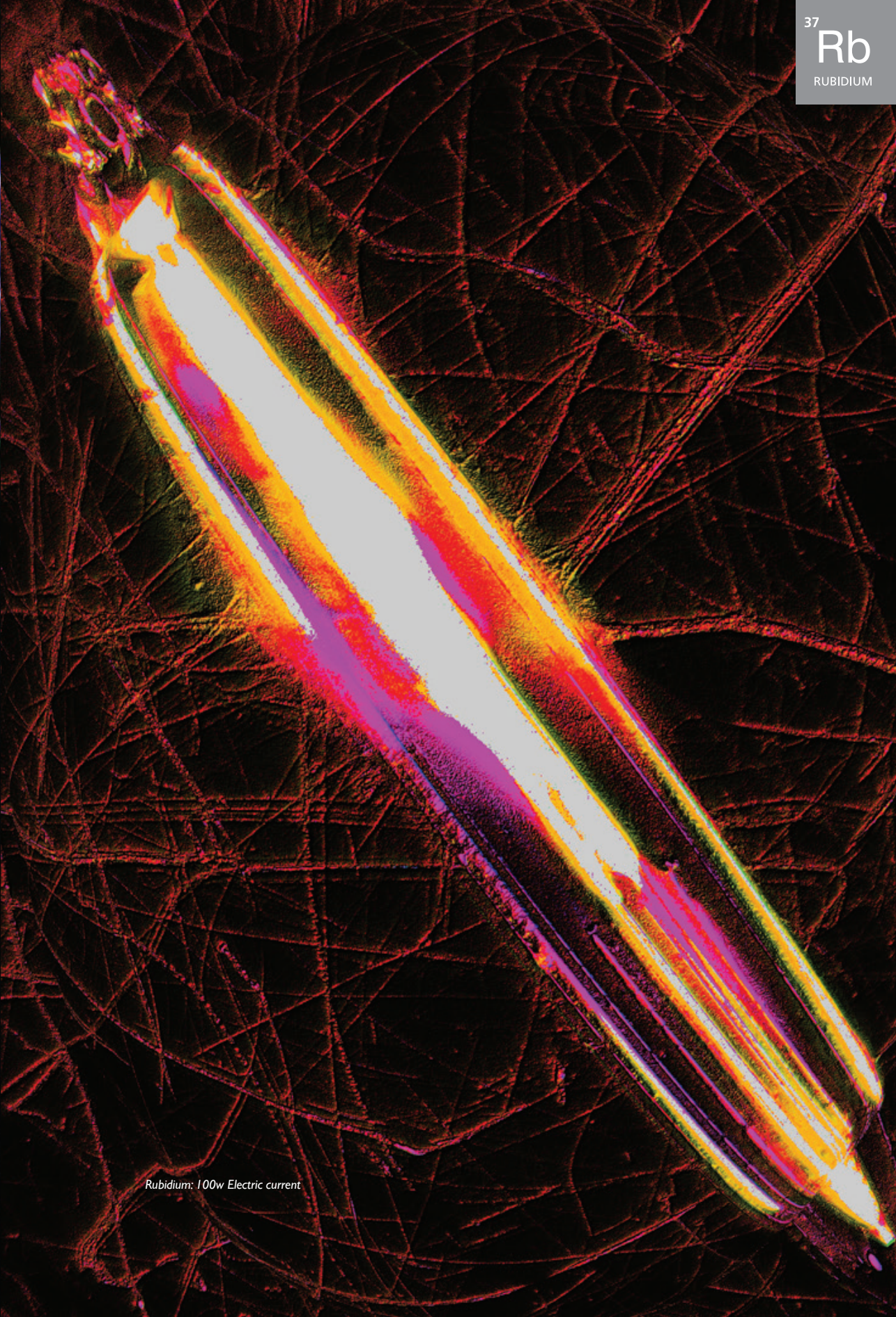


Rhenium: Darkfield

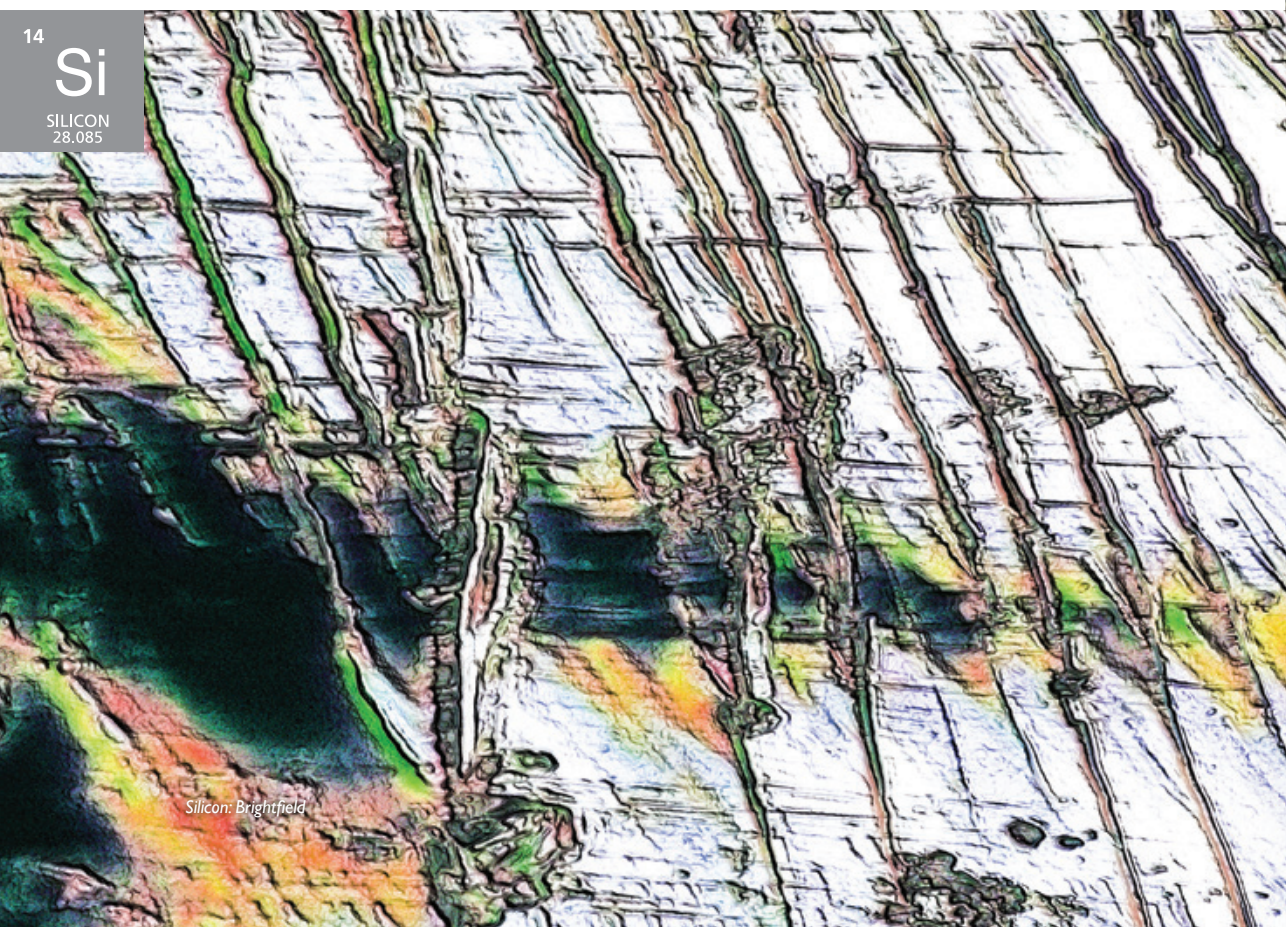
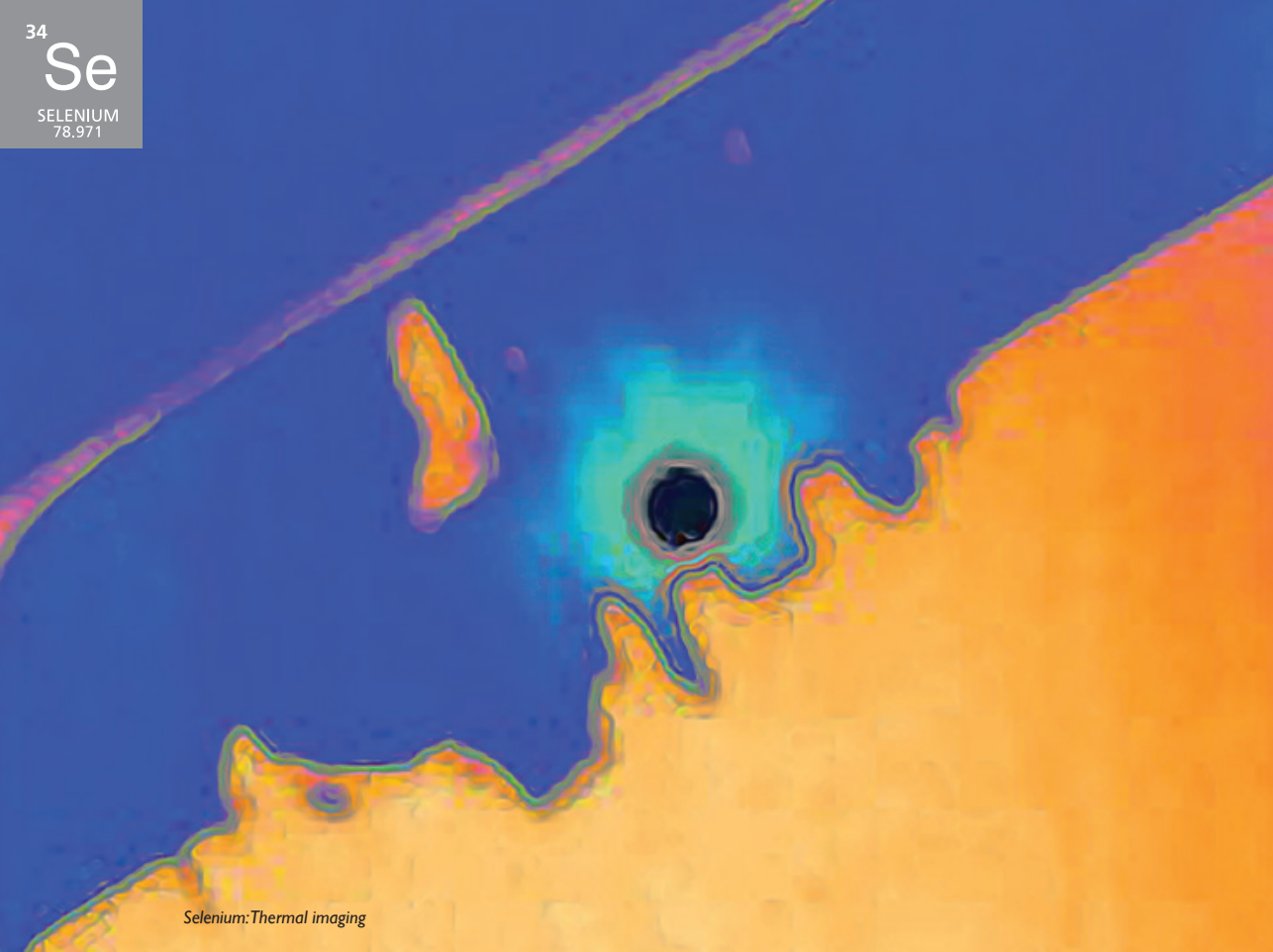
37

Rb

RUBIDIUM

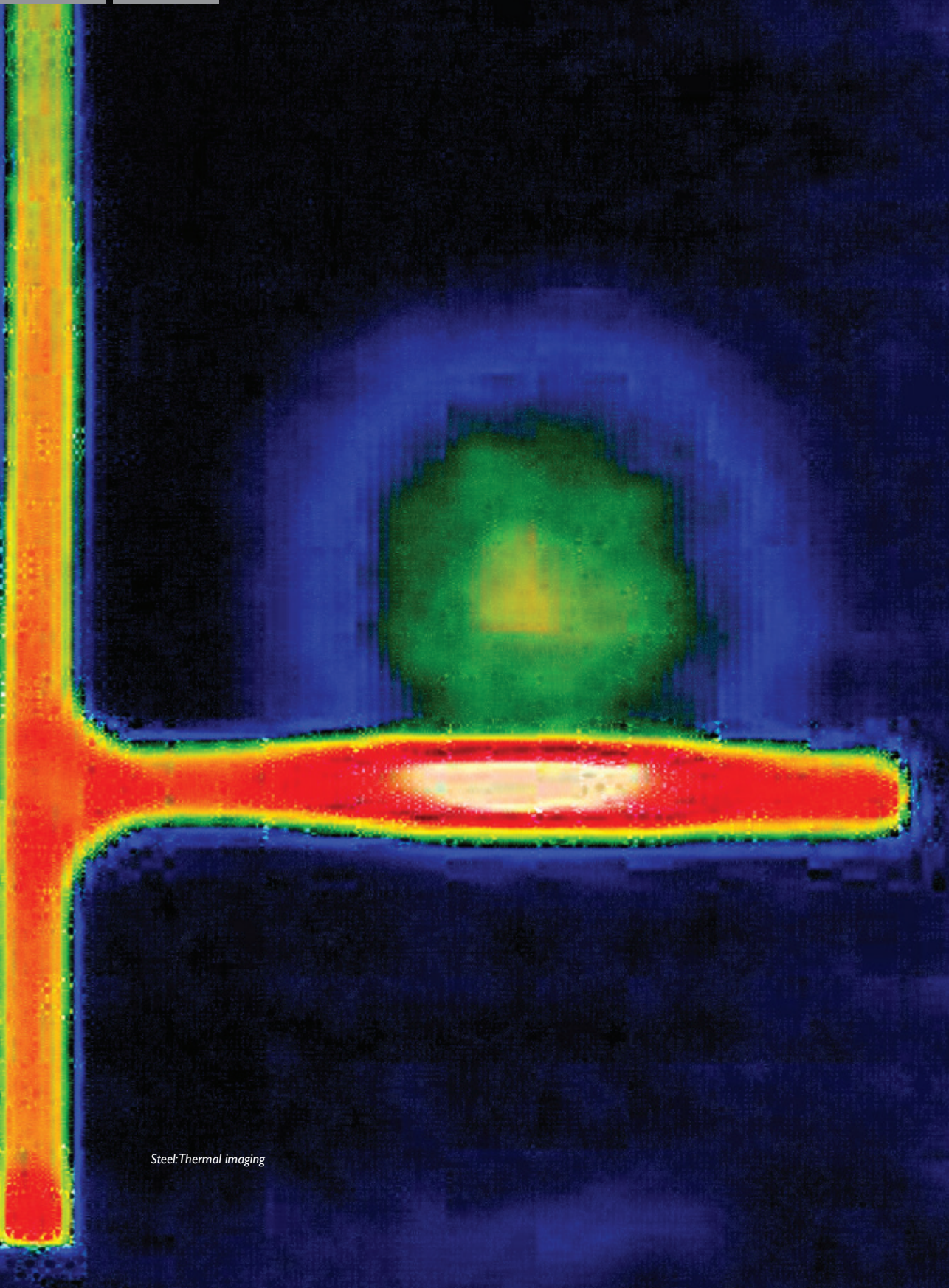


Rubidium: 100w Electric current



²⁶
Fe
IRON
55.845

⁶
C
CARBON
12.011

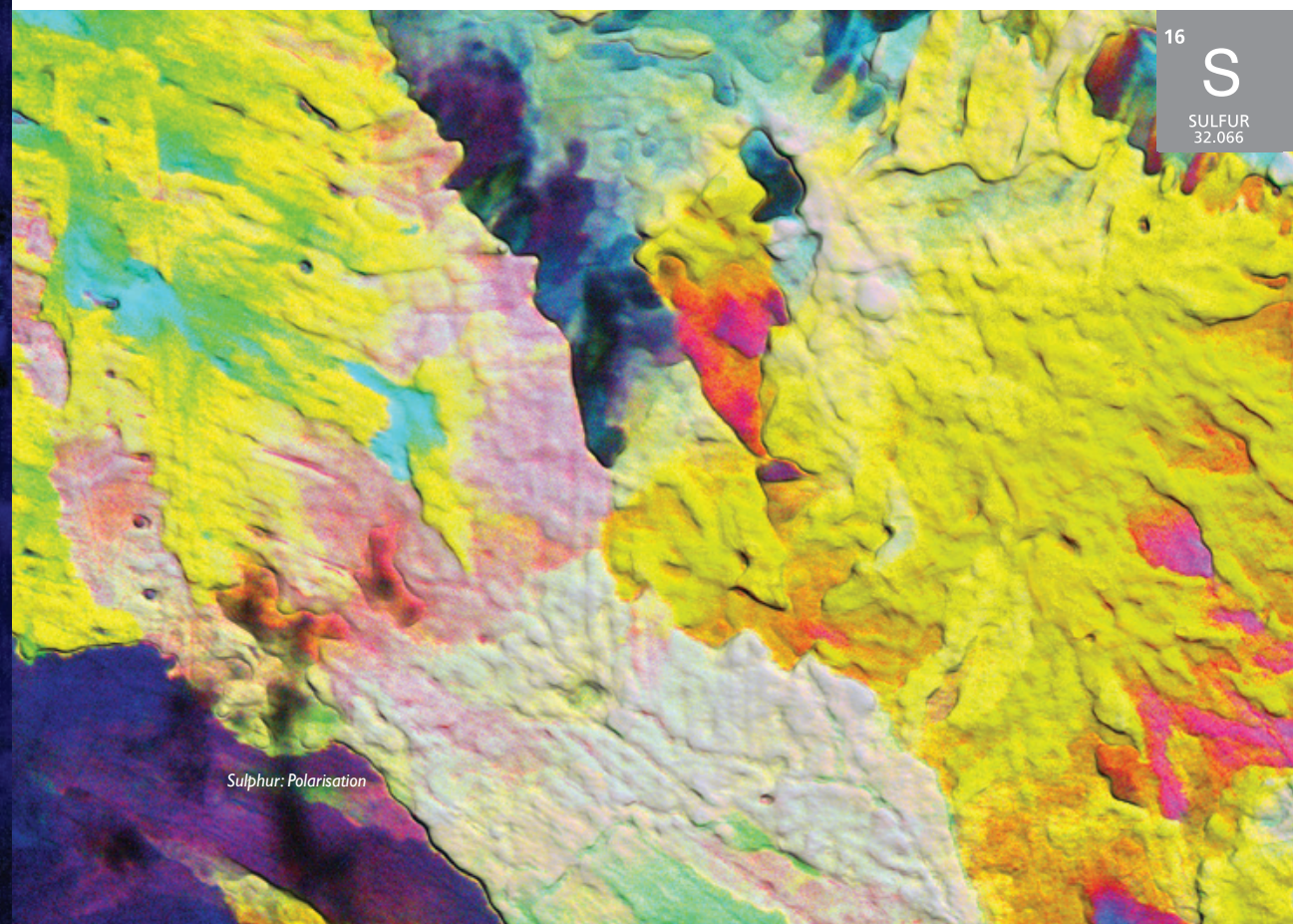


Steel: Thermal imaging



Strontium: Brightfield

³⁸
Sr
STRONTIUM
87.62

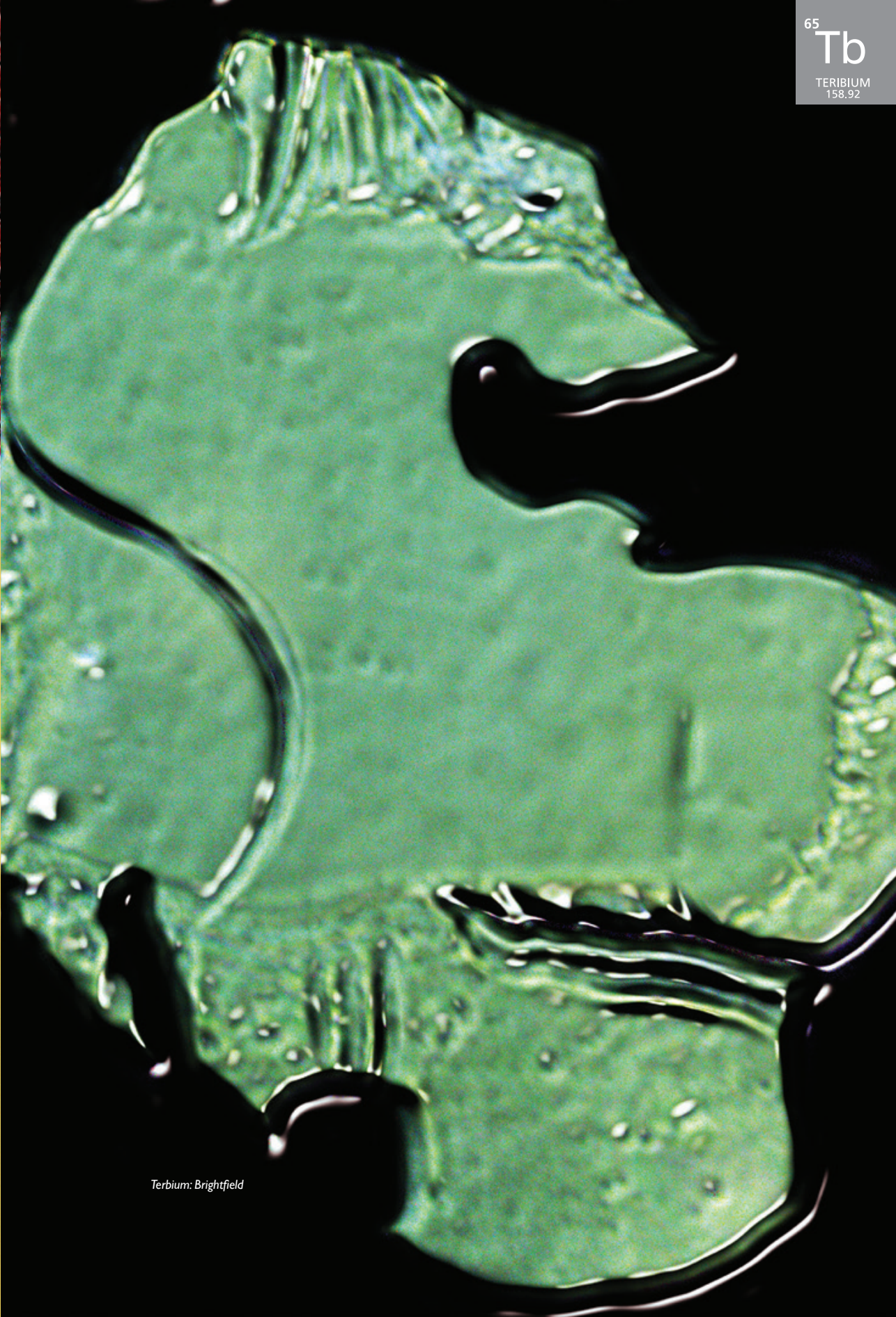


Sulphur: Polarisation

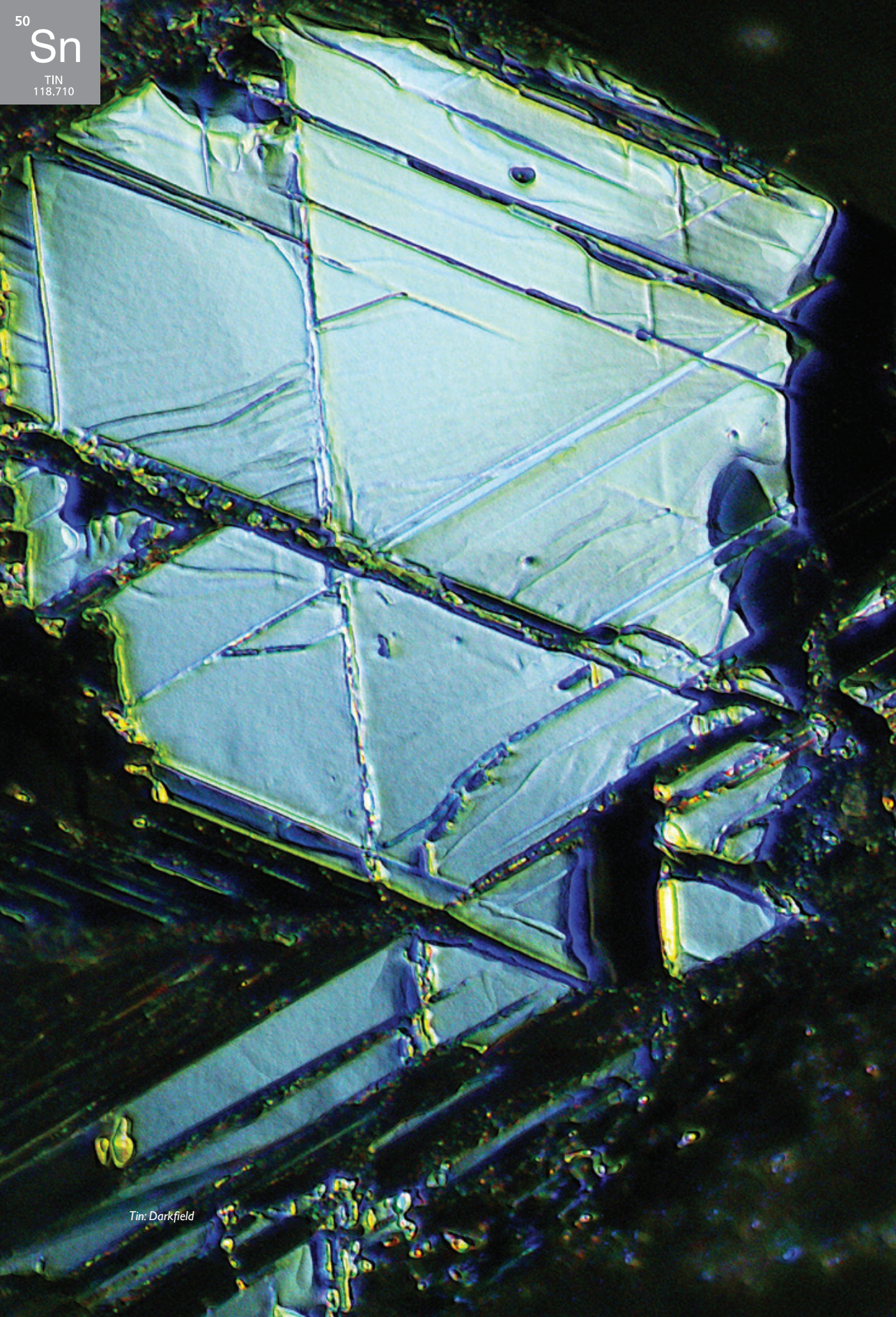
¹⁶
S
SULFUR
32.066



Tantalum: Thermal imaging

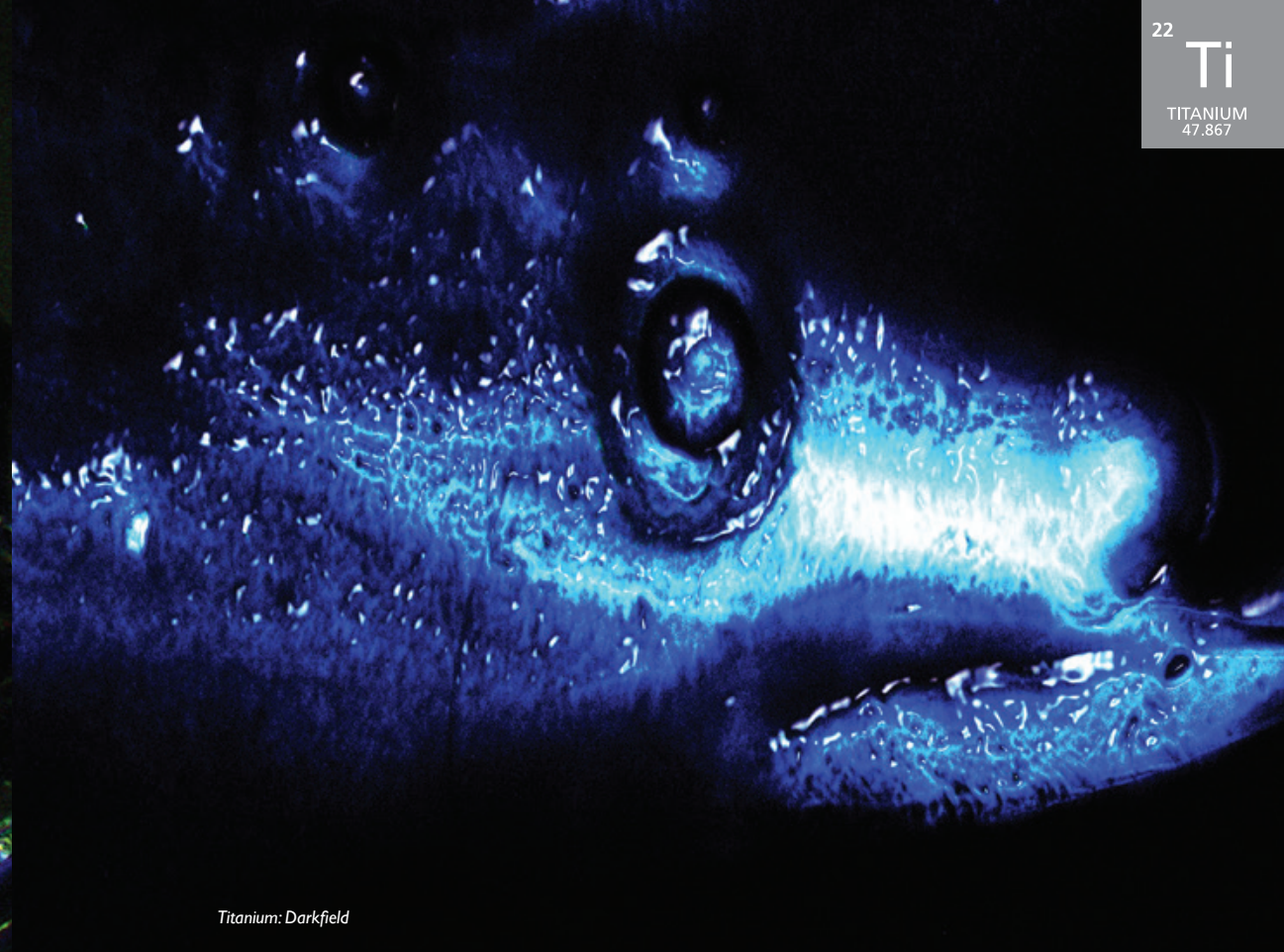


Terbium: Brightfield



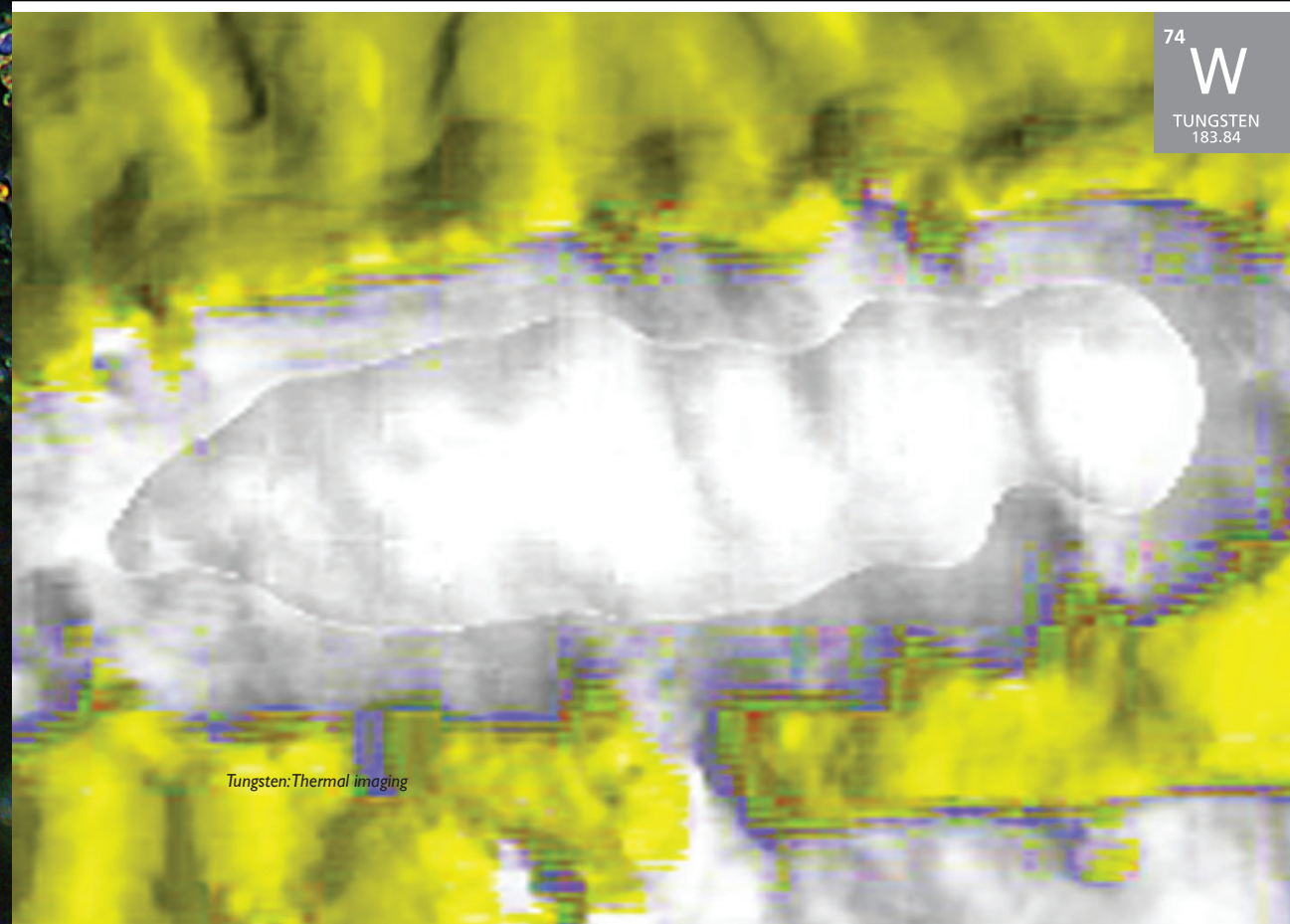
50
Sn
TIN
118.710

Tin: Darkfield



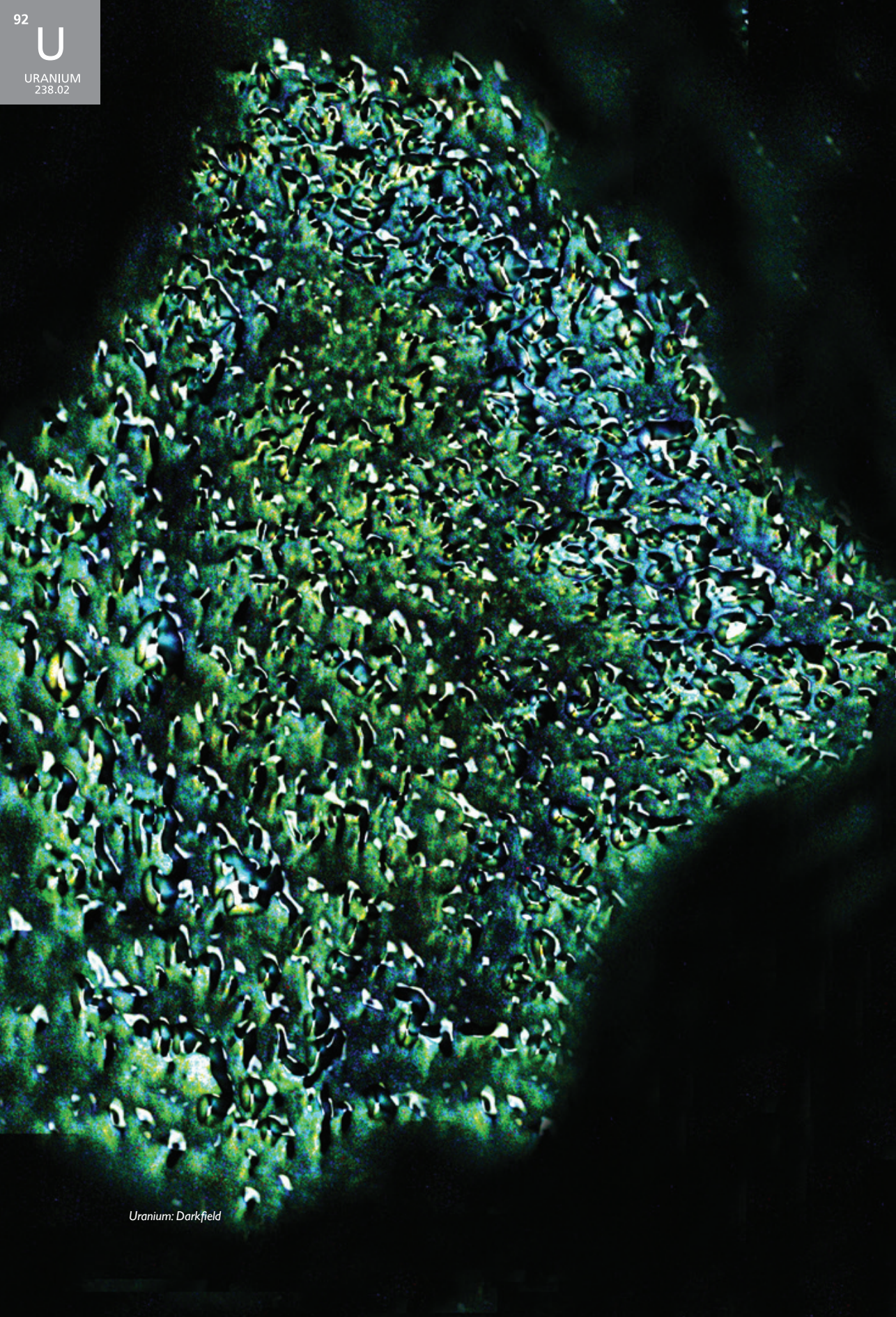
22
Ti
TITANIUM
47.867

Titanium: Darkfield

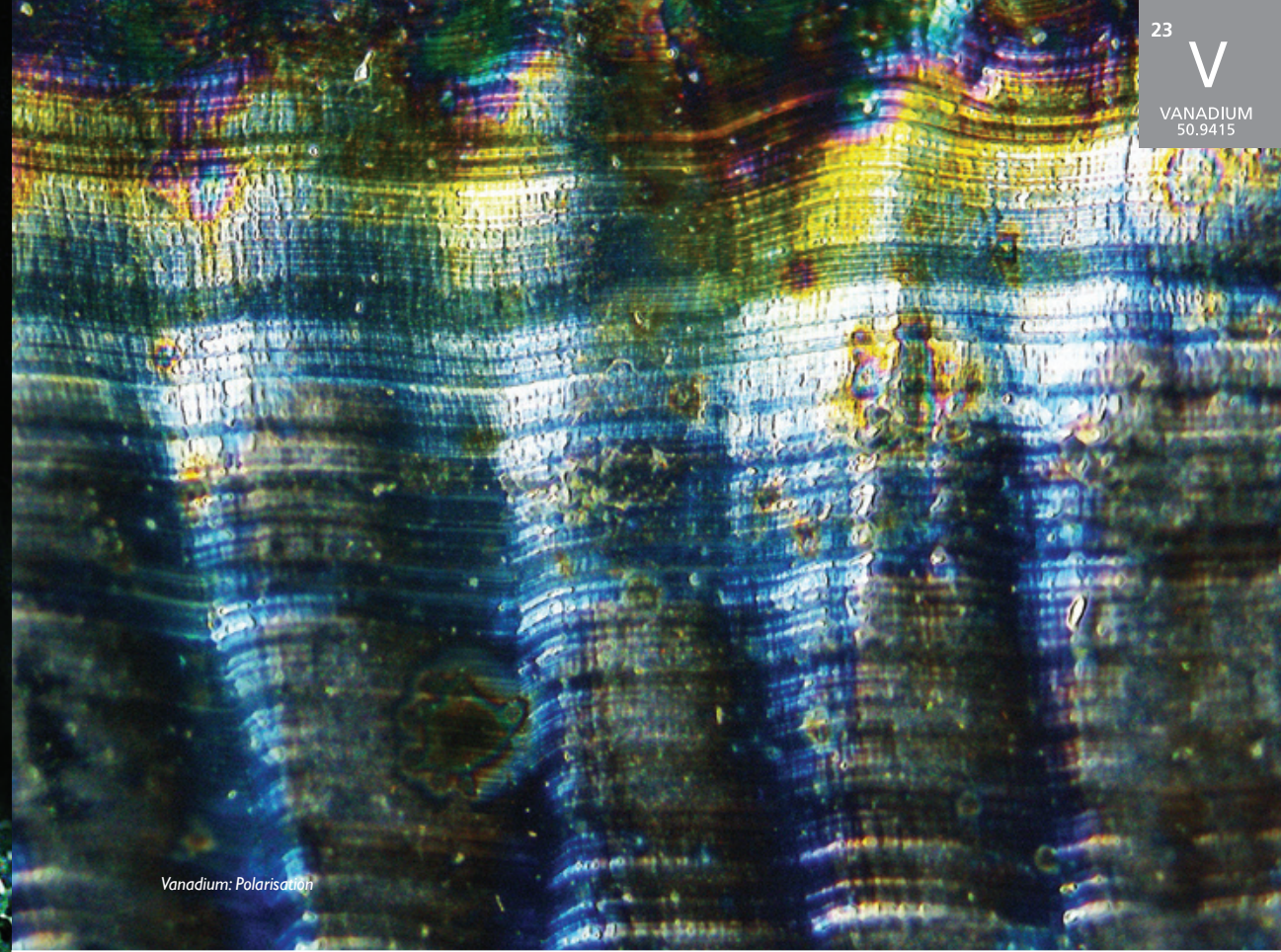


74
W
TUNGSTEN
183.84

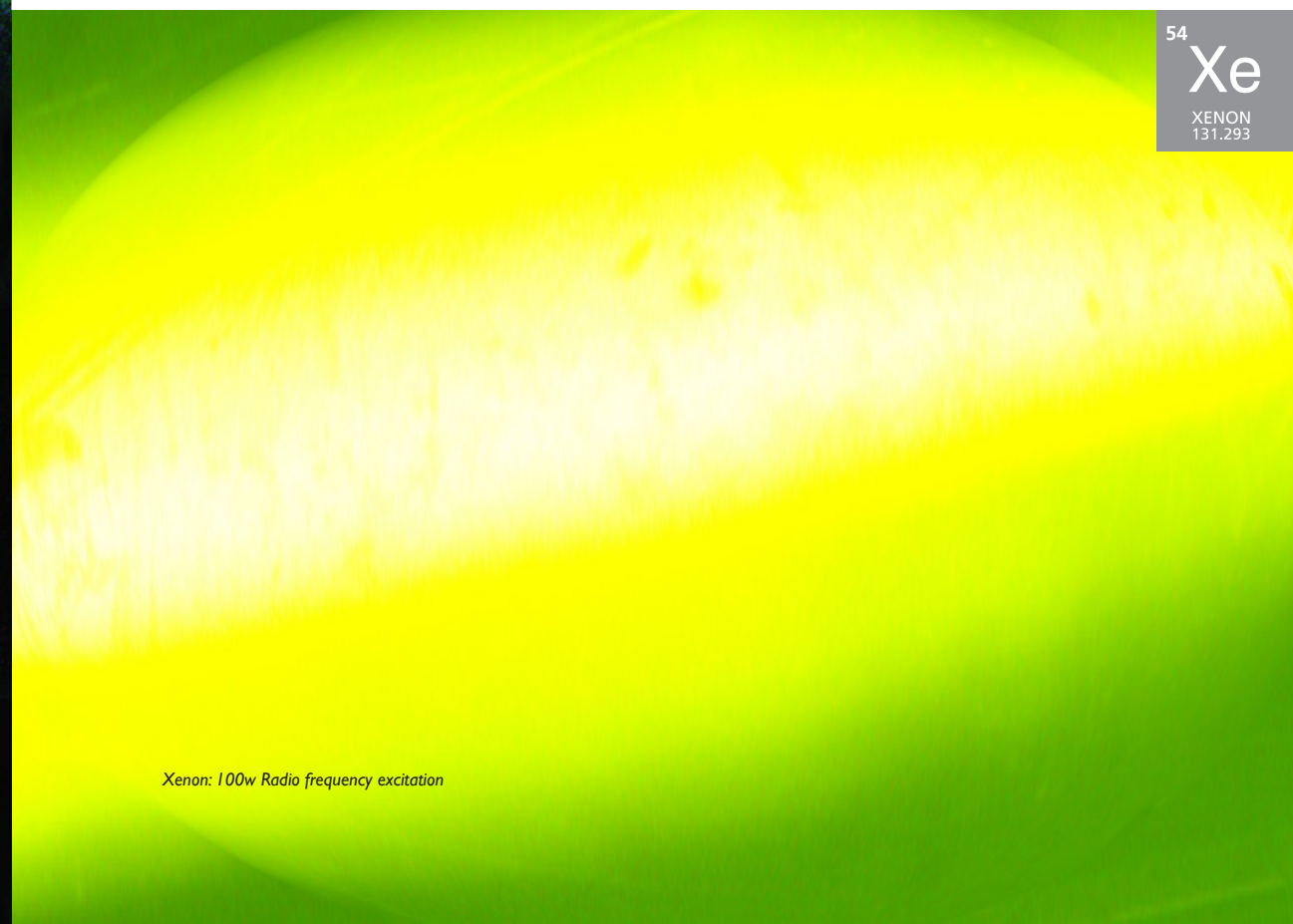
Tungsten: Thermal imaging



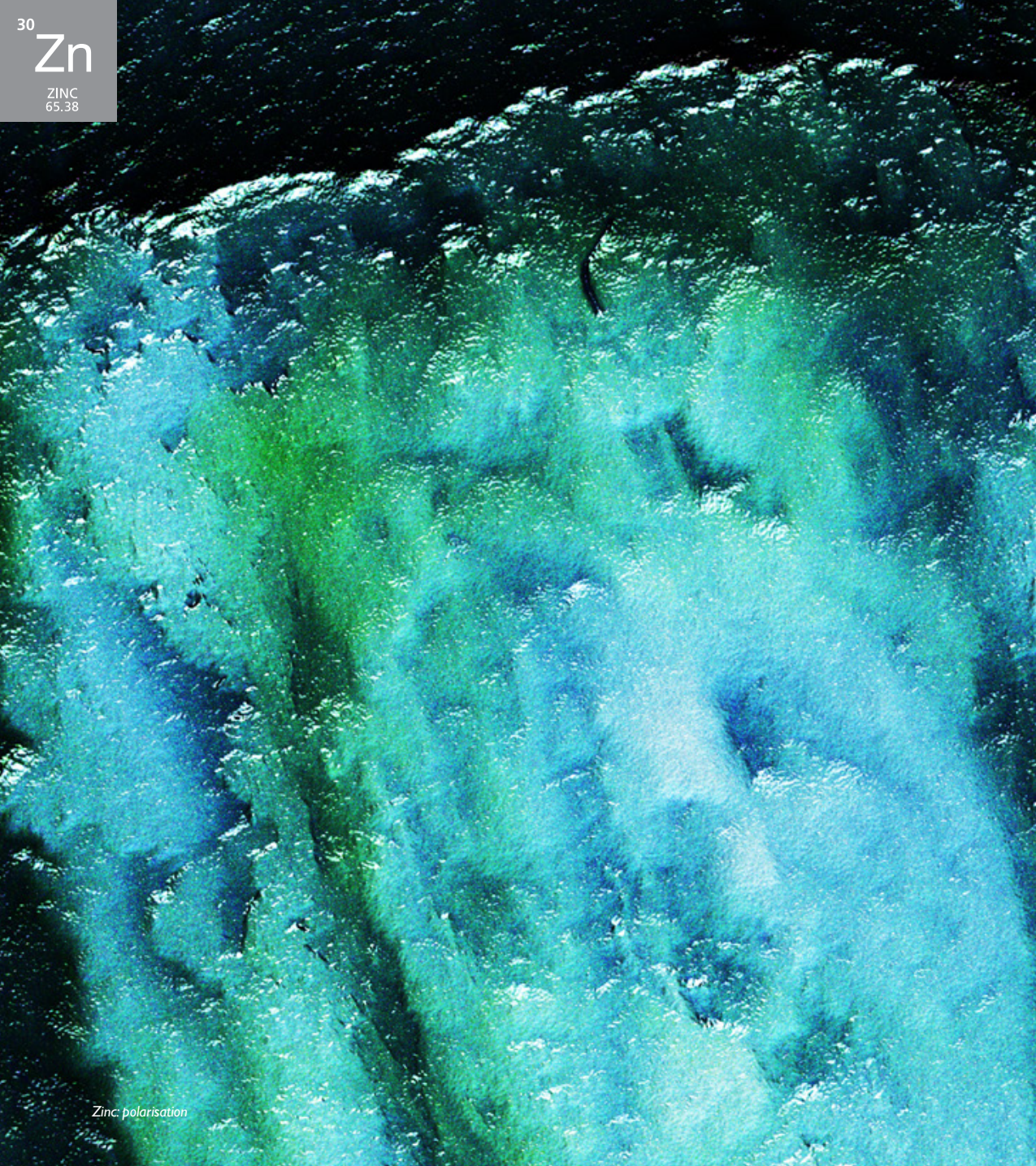
Uranium: Darkfield



Vanadium: Polarisation



Xenon: 100w Radio frequency excitation



Zinc polarisation

Take SEM image analysis to new heights

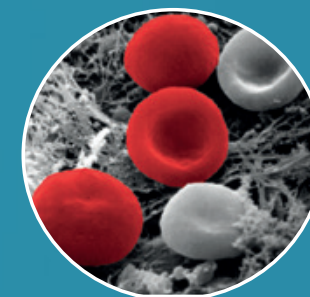
3D topography reconstruction



Advanced particle analysis



Quick & easy colorization



About the author

Winston Ingram was born in 1940, and from an early age developed an interest in Science and Photography.

He went into private practice in 1978, working freelance for various companies, and teaching

scientific, medical and technical photography. He retired in 2002 and started producing books using photo microscopy as an art form. He likes to explore different techniques with the microscope, and also mix the various facilities available.



Mountains8

SOFTWARE FOR IMAGE ANALYSIS
www.digitalsurf.com