Mineralogical Society of Western Australia Inc.

To encourage mineralogical study by amateur and professional alike and, in so doing, discover, document and preserve the Earth's, and in particular Western Australia's, natural history.

NEWSLETTER 112
September 2025

CONTENTS

EDITORIAL

Welcome to the 112th issue of our MinSocWA newsletter. Although, while preparing the 25th Anniversary summary, it was noted that somewhere along the line a Newsletter number was skipped, so maybe this is the 113th(?). Never mind, we will just continue with 112 …

Our July talks were interesting and varied covering some special gems, fabulous opaque crystals and a quick look at Geological Survey of Western Australia information on the new website.

Our talk after the AGM in September was a most interesting exploration of diamonds in the Kimberley region, and WA.

HAPPY BIRTHDAY. October 2025 marks the 25th anniversary of MinSocWA Inc., and we have organised a celebration for this milestone birthday!

Another bumper read for you to revisit, or find out what you missed.

Articles for the fourth quarter Newsletter are due by 5 December 2025. Please make sure to prepare them in plenty of time to arrive before the 5th as Christmas will be literally around the corner soon. Thank you.

Wendy H
Newsletter Editor

What is this? A fake gemstone? A child playing with a texta?

Read on to find out …

25th ANNIVERSARY CELEBRATION EVENT

$20 per person (see October Bulletin for link to purchase your ticket)
28 October 2025 doors open at 7.00 pm – until late
Verandah Bar, Inglewood Hotel, cnr Beaufort St and Fifth Ave, Mount Lawley

JULY 2025 TALKS

Dianite – A relatively new gem-quality rock
Compiled by Wendy Hampton

Figure 1. The sample of Dianite given to Olga Blay causing her to research more about the mineral

Dr Olga Blay from the Geological Survey of Western Australia gave a very interesting talk about a rare gemstone given the name Dianite in 1997, after the death of Princess Diana. It is a rare gemstone from the Eastern Siberian Region of Russia.

Dianite has a distinctive dappled blue/green look that could be mistaken for nephrite jade. It is sometimes called Siberian blue nephrite or blue jade. Dianite is found as small pebbles and consists of a fibrous felted-micro-texture.

Discovered by Soviet geologist A. Konev in the 1970s, it has only one locality at Aleksandrovski Creek, within the Kedvoviy Stock at Yakutia of the alkaline Murunskiy Complex Intrusion of the Aldan Shield near where the Chara and Tokko Rivers confluence.

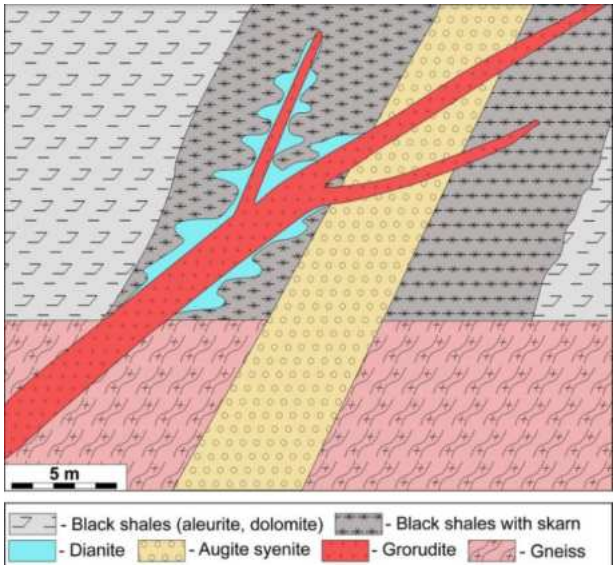
In 1990, JSC Murun Company found a large outcrop in grorudite country rock, an alkaline-rich variety of aegirine-bearing rhyolite, during their exploration activities.

In 1995, mining of dianite commenced from the complex magmatic-hydrothermal system, which was later overprinted by a metasomatic event. Around 3 tons of dianite has been recovered along outcrops of 20-30 m wide.

Figure 2. Dianite displaying a fibrous-felted micro-texture

Mineralogically, dianite is a complex gem-quality rock being mainly composed of amphibole-supergroup species:

- *early-magmatic magnesio-hastingsite – pargasite* $NaCa_2(Mg_4Al)(Si_6Al_2)O_{22}(OH)_2$
- *late-magmatic potassic-magnesio-arfvedsonite* $KNa_2(Mg_4Fe^{3+})Si_8O_{22}(OH)_2$ *(most abundant type)*
- *minor replacive potassic-richterite* $K[(Ca,Sr)Na][Mg_5]Si_8O_{22}(OH)_2$



Arfvedsonite envelopes abundant anhedral k-feldspars as well as being associated with interlayers of siltstone with clusters and nest-like micaceous aggregates.

Dianite is only located in the Kedvoviy Stock in carbonaceous black shale, along with interlayers of siltstone and dolomite. It forms lenses and veins at the contact with grorudite dykes cutting through phlogopite-forsterite-monticellite skarn (after dolomite).

Figure 3. Modified by Dumańska-Słowik et al. (2022) after Vladykin (2009)

An interesting spotted ornamental rock

Compiled by Francine Payette

Susan Stöcklmayer's talk covered the mineralogy of an ornamental rock known by the trade name *K2 Granite*.

K2 Granite is an interesting rock and features as a lapidary material reportedly found at the base of K2 Mountain in the Karakoram Range, near the Pakistan-China border.

It is typically white or light grey, speckled with blue orbs.

On a broken surface the blue orbs look like drops of bright blue ink that splashed onto the rock. Upon closer examination, however, it shows that they are actually spherical in shape.

Although *K2 Jasper* is a commonly used name for marketing this material, it is definitely not jasper. Observation of the rock with a hand lens, reveals cleavage faces of feldspar minerals and black flakes of biotite. Some specimens show strong alignment of the biotite grains and it could be called 'granite gneiss.'

Figure 1. Tumbled specimen of K2 Granite 20 mm

Many people see this material at mineral and lapidary shows and immediately think that the round blue dots have been produced with a dye. When they learn that the blue dots consist of azurite, they usually have a hard time believing it because granite and azurite would rarely occur together.

This unusual and incompatible nature resulted in discussions and work to check its authenticity.

Susan obtained some samples and performed a series of tests that included: hand specimen examination, acid testing, and optical microscopy performed on polished thin section (see Figure 2 and 3).

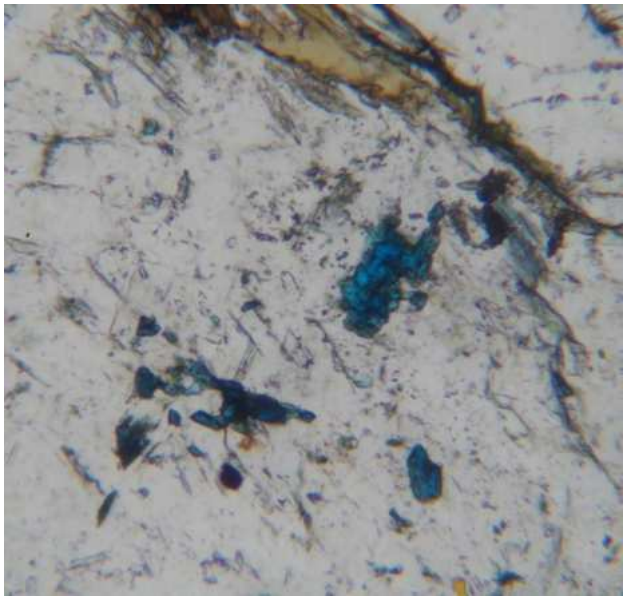


Figure 2. K2 Granite: *Microscope thin section shown in plain polarized light 100x, with scattered grains of azurite in feldspars*

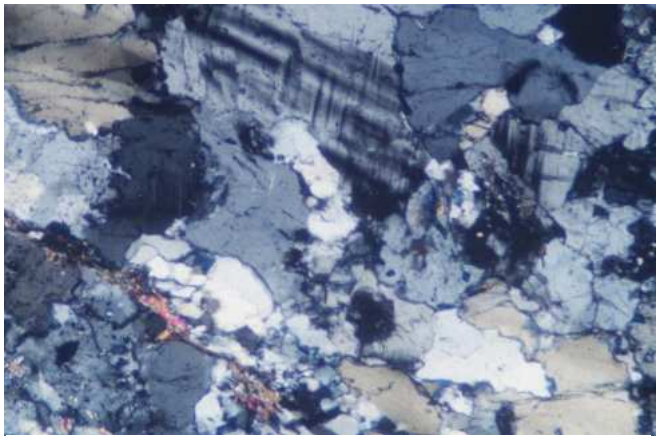


Figure 3. K2 Granite: Microscope thin section of the granite host rock; felsic mineralogy consists largely of quartz and alkali feldspar with biotite mica

The results of these tests were described, as well as others performed in some published investigations that included the following research methods: X-ray diffraction (XRD), Scanning electron microscopy (SEM), and QEMSCAN (quantitative evaluation of minerals by scanning electron microscopy).

The results confirm that this ornamental stone is a granite that has undergone some metamorphism, resulting in some fracturing and a noticeable and slightly banded appearance. Secondly, a blue material that was proven to contain copper and identified as azurite (effervesces in dil. HCl) infiltrated the rock at a later period. Some smaller green areas that show as a green mineral associated with the azurite are likely to be malachite (we know that azurite weathers pseudomorphs into malachite).

In conclusion, Susan mentioned that more tests would be needed to explain how this material formed. We will certainly hear more from her in the future.

Rollinson G, 2017. *Mineralogical analysis of K2 Granite,* Unpublished study at CSM University of Exeter, UK (pdf copy of PowerPoint presentation)

King HM, *"K2 Granite," also known as "K2 Jasper" - An azurite granite found at the base of K2, the world's second-highest mountain,* www.geology.com

GSWA on the new WA Government website

Complied by Olga Blay

In July 2025, the WA Government established a targeted reform of nine government departments to align with their new Government priorities of a more resilient economy. Website information and services have been updated to reflect the new structure replacing the former Department of Energy, Mines, Industry Regulation and Safety (DEM**IRS**). Wendy Hampton explained the split:

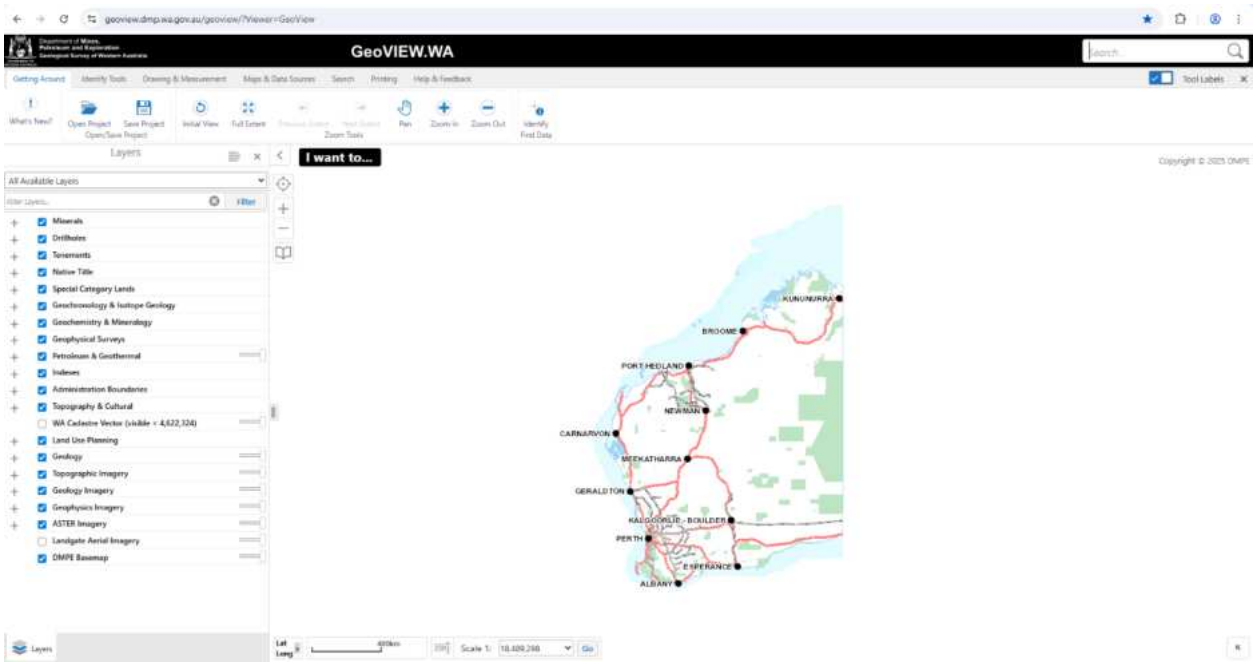
1. DEMIRS' Resource and Environmental Regulation functions - Department of Mines, Petroleum and Exploration (DMPE), pronounced as D-M-P-E, now found at www.dmpe.wa.gov.au retaining the majority of the 'Mines Department' functions that exploration and mining people would recognise, including Geological Survey of Western Australia (GSWA)

2. Department of Local Government, Industry Regulation and Safety (LG**IRS**), pronounced L-Jeers, and found at www.lgirs.wa.gov.au, where all the safety and regulations for WorkSafe can be found, including consumer protection for builder, electrician, painter, and all types of licensing

3. Energy Policy WA joined the Department of Energy and Economic Diversification (DEED), the energy part of the previous DEMIRS, but not covered in this talk

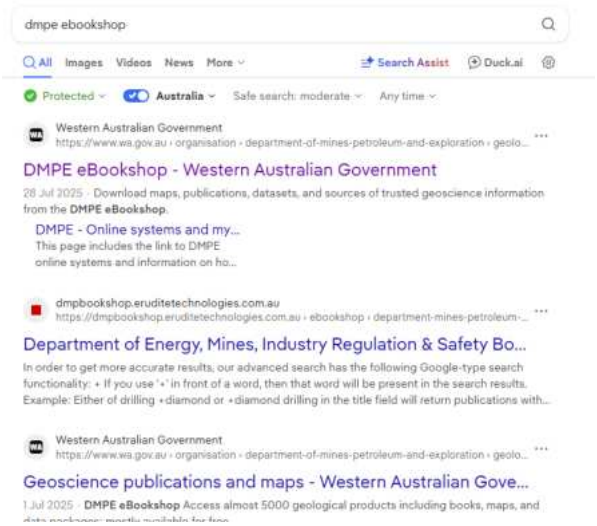
Wendy then demonstrated how to locate GSWA information that we are familiar with such as GeoVIEW.WA, eBookshop for GSWA publications, and newsletters like Fieldnotes. She demonstrated the best way to search for knowledge is by opening a web browser and typing in the name or item that we are familiar with.

For example, search for *GeoVIEW.WA* and it should be the first reference that appears. If not, pick another link mentioning GeoVIEW.WA and then look for the button 



Once in GeoVIEW.WA, there are a variety of datasets, including GSWA Catalogue, WAMEX, Drillholes, Geochemistry, Geochronology, Historical Mining Tenements Maps, Explanatory Notes System (ENS) to name just a few. The 'Search Tools' tab in GeoVIEW.WA allows advanced searches for these datasets.

On the DMPE website, scroll down to find Geological Survey of WA. Open the link. The GSWA webpage provides links to eBookshop, State maps and statewide datasets, WA Array, Publication and maps, and many more. From the Publication and maps page you can also access eBookshop publications and GeoView.WA. Or you can just type in your browser *DMPE eBookshop* and follow the link, or another likely page and then find the black button that says "*Access the DMPE eBookshop*".



In the search window of the eBookshop type 'Fieldnotes' – it will display all available Fieldnotes publications.

To find a publication, record, report, maps, or other products, just choose from the search options.

From the main DMPE page you can also access the DMPE Library Catalogue. Type in the Search WA.gov.au window '*Library Catalogue*' to show links to the department's Mineral House (MH) Library Catalogue and information on how to access and search the State Archives Collection. The Mineral House Library Catalogue contains a huge number of articles and publications of interest, for example, many AJM issues.

Wendy noted there are still references to DEMIRS in the header and footer for most pages, while the IT section catch up with all the changes that are taking place.

September AGM and Talk

A quick formal AGM this year saw a few changes to our committee as we said goodbye to President Peter Willems and welcomed James Sherborne to the role. We also said thank you to Angela Riganti as she leaves the Secretary role and now "sits" with the rest of the ordinary committee. We said goodbye to Niels Dahl and Wendy Hampton from the committee, but retained Wendy as Membership Secretary and Newsletter editor.

MINUTES
25th Annual General Meeting of the
Mineralogical Society of Western Australia Inc
held at the clubroom of the WA Lapidary and Rockhunting Club,
31 Gladstone Road, Rivervale, on Wednesday 10th September 2025 at 7.00pm

1. Opening and Welcome: President Peter Willems at 19:18
2. Present: Alan Longbottom; Allan Hart; Angela Riganti; Bruce Groenewald; Clive Daw (late arrival); Craig Bosel; Frank Doedens; Grant Boxer; Ida Newton; James Sherborne (late arrival); Jason Bennet; Judy Paish; Lena Hancock; Malcom Mason; Mary Sherborne (late arrival); Maryam Parsajoo; Murray Thompson; Nicolas Hébert (online); Nimal Perera; Olga Blay; Peter Pring (online); Peter Willems; Stewart Cole; Stuart Jeffries; Susan Stöcklmayer; Tom Bateman; Tony Ahmat; Vernon Stöcklmayer; Wendy Hampton. Ian Townsend attended as a visitor.
3. Proxies: John Mill (Angela Riganti); Kari Pitts (Angela Riganti); Lyn Dahl (Chair); Niels Dahl (Chair)
4. Apologies: Barbara Donati; Francine Payette; George Stacey; Mike Freeman; Mike Wort; Renee Wee; Sue Koepke; Vino Vigneswaran

5. Confirmation of the Minutes of the 24th Annual General Meeting held on 11 September 2024 (emailed)

Acceptance of the Minutes to be moved and seconded.
Moved: Peter Willems. Seconded: Stewart Cole. All in favour.

6. President's Report – Peter Willems' report attached at end of minutes.
   Acceptance of the President's report to be moved and seconded.
   Moved: Stewart Cole. Seconded: Murray Thompson. All in favour.

Angela Riganti moved a vote of thanks for outgoing President Peter Willems, citing especially his vision and leadership role in getting the PGMS up and running so successfully. All in favour.

7. Treasurer's Report – John Mill. In John's absence, Peter Willems read the financial summary; some re-assigning of some entries to more specific items relative to the report emailed with last AGM notice were noted, as well as the addition of the term deposit and PGMS payment liability.

Acceptance of the Treasurer's report to be moved and seconded.
Moved: Peter Willems. Seconded: Jason Bennet. All in favour.

8. Election of Patron Peter Willems moved to accept Mark Creasy as the patron of the Society, Seconded Tom Bateman, Craig Bosel, Murray Thompson. All in favour.

9. Election of Members of the Management Committee:
   All positions to be declared vacant in accordance with the Constitution.

Returning officer: Stewart Cole

10. Resolution: that the number of ordinary members to hold office for the next year is set to 7 and that more can be added as necessary throughout the year. Moved: Stewart Cole. Seconded: Peter Willems. All in favour.

Nominations closed 18 days prior to the AGM. Stewart Cole proceeded to list the nominations received (see table below). All were elected unopposed.

Position	**Nominee**	**Supporter**
President	James Sherborne	Angela Riganti
Vice president		
Secretary		
Treasurer	Vinodaarshini Vigneswaran	Angela Riganti
Field trip co-ordinator		
Ordinary committee member	John Mill	Wendy Hampton
Ordinary committee member	Susan Stöcklmayer	Vernon Stöcklmayer
Ordinary committee member	Angela Riganti	Vernon Stöcklmayer
Ordinary committee member	Mike Wort	Susan Stocklmayer
Ordinary committee member	Nicolas Hébert	Wendy Hampton

The elected Committee will need to meet as soon as practical to address the lack of nominations for the Vice-President and Secretary's roles. Angela Riganti indicated she will assist a nominated secretary in the transition.

Stewart Cole moved that all members of the 2024-2025 Committee be thanked for their hard work. Seconded: Tom Bateman. All in favour.

11. Closing of AGM by President: As the newly elected president, James Sherborne thanked everyone and closed the meeting at 19:36.

President's Report for the period September 2024 to September 2025

Thank you for attending our 25th AGM. This year we are celebrating the milestone 25th anniversary of the Society, and it has been my honour to serve as its president for the last four years.

A brief history of the Society is being compiled, so that we can have an official record of some of our achievements over this quarter of a century. MinSocWA is in a solid financial position, and can boast a membership of over 100 members, so we must be doing something right!

It is rewarding to see the Society flourish, but it is a lot of work to make things happen, and we are very grateful to those members who have served on the committee over the last year and those who contribute in many other ways, big and small. As well as everyone who has participated in our activities in the past 12 months thereby actively supporting our Society and making our efforts worthwhile.

Special thanks/mentions

Angela has served for many years on the Committee, including two as Vice-President and the last four as Secretary. She is stepping down from the Secretary's role but will stay on the committee a little longer to pass the baton on.

Wendy and Niels are stepping down from the committee. Wendy has been our newsletter editor and membership secretary, as well as covering the secretary's role while Angela has been away, and we are sorry to see her go. Niels has been behind many of our refreshments for the evening talks, and we are pleased to see he will continue to help there (as well as the PGMS) even if not on the committee. With Vernon Stöcklmayer and Angela, Niels has also compiled the document celebrating our 25th anniversary.

Vino has been looking after the financial side of things for both the Society and the PGMS, while juggling FIFO commitments. As our resident librarian, John has kept us informed with summaries of articles from our mineral magazine subscriptions, as well as coordinating two mineral markets in July and April, and assisting with many PGMS matters. Susan is always our port of call for mineral identification, is a regular contributor of articles to the Newsletter, and she has been coordinating our MinSoc booth since the start of the show – but now looking forward to passing that responsibility on.

James has filled in for me during my many travels, and Nic has contributed a lot to the organisation of the PGMS. I am pleased to announce that Nicolas will be stepping up as Chair of the PGMS Committee next year. Many thanks to all for their contribution to the committee, without you we won't have a MinSoc.

And to those members who help in many other ways: teas, auctions, donations…

I also take this opportunity to thank our patron, Mark Creasy, for his continued support of our society.

Special mentions outside the committee

Many members not on the Committee have been contributing in many ways.

I'd like to acknowledge Lena Hancock for coordinating the *Introduction to Mineralogy* course held for the first time this year. I also would like to recognize and thank the many organisations that have supported the course with speakers, or for making their venues available for visits.

A special mention to Peter Pring, who has coordinated and run two field trips to Mukinbudin in November and May. And to Murray Thompson, who once again opened his Desert Fire Designs workshop for members in February.

On a sad note, we need to remember the passing of one of our founding members, Ted Fowler, on 1 November last year.

Many thanks to our speakers, most of which are MinSocWA members, for putting their hands up to share their mineralogical knowledge. Our bi-monthly meetings this year included talks from Svetlana Tessalina, Lena Hancock, J.Lynn Sutherland, Nic Hébert, Stuart Jeffries, Olga Blay, Léonie Rennie, Steve Turner, Craig Bosel, Wendy Hampton and Susan Stocklmayer; Grant Boxer is our speaker for tonight. Their talks' titles are listed at the end of this report.

In August, many of our members enjoyed a mixer at Crystal Universe. Although it wasn't technically a 'MinSocWA' event, our members made a significant contingent, and these events are always a good opportunity to socialise.

All contributors to Newsletter, volunteers at events, donors, tenement holders who have provided access to their leases are greatly acknowledged.

Projects

Two of MinSocWA projects, the Simpson Project and the quest for a WA mineral/gemstone emblem, have stalled a bit, and it will be up to the new Committee to decide which direction we want to take there.

It will be our turn to host the 49th Joint Seminar in 2027. *Mineralogy for the 21st century* is the theme we are leaning on, which will allow incorporation of topics such as critical minerals and pegmatite-related subjects, as well as analytical developments in mineralogy. Thanks to those who have put their hands up to contribute to various aspects of this event – we are still looking for an overall coordinator. Getting the seminar up and running takes a great deal of work, but it is also rewarding for both the Society and the participants.

PGMS

The fourth Perth Gem and Mineral Show (PGMS) held in October 2024 was again the highlight for the society. Thousands of attendees have delivered a good financial income for MinSocWA, but let's not forget the value of reaching out to the general public and especially kids to deliver education on many aspects of mineralogy – one of the prime missions of the show!

Last year saw a greater number of international vendors attending, which is certainly putting Perth on the 'mineralogical' map of Australia and the world.

Once again, a big thank you to Mark Creasy for his unwavering support of this event, both financially and with exhibits, as well as to other sponsors, volunteers, presenters and to participants.

The Charity Rocks auction was again very successful, raising about $16,000 for worthwhile causes, including supporting MinSocWA itself. All this required a lot of hard work behind the scenes and excellent support from our sponsors. I'd like to congratulate the PGMS committee Norton Kalleske, Nicolas Hébert, J.Lynn Sunderland, Nicola Italiano, Mitch Elphick, Art Hoffmann, Elliott Bettend, Vino Vigneswaran, John Mill, Kylie Matonia and Luke Maxwell — on their achievements.

Closing

Don't forget all committee members can be contacted, and committee meetings are open to any member who may wish to present a special request. Contact details are given in both the monthly Bulletin and the Quarterly newsletter.

A social celebration for the 25th anniversary of MinSocWA incorporation is planned for the 28th of October, at the Odin Tavern. Please do join us to celebrate some of the milestones that the Society has achieved.

Finally, I will be stepping down as President and from the Committee due to two life-changing events in the near-future. We are expecting our second baby in December, and we'll be moving to Spain early in

the New Year for the foreseeable future. I am certain the Society will be in good hands with the new Committee — but, as members, I urge you to support your committee, either formally or indirectly, to make their work as volunteers lighter, to continue delivering an engaging program, and make MinSocWA flourish into the coming 25 years.

Peter Willems

President Mineralogical Society of WA Inc., Australia, 2024-25

Presented September 10th, 2025

Appendix - 2024-25 MEETINGS AND EXCURSIONS

10 Jul 2024	• Associate Professor Svetlana Tessalina (John de Laeter Centre) and Dr Lena Hancock (GSWA) • J.Lynn Sunderland	• What have we learnt about dating of gold? • Adventures at the Tucson Mineral Show
11 Sep 2024	Nicolas Hébert	Pegmatites — From SE Asia to Australia; a journey through Afghanistan, Pakistan, Myanmar, Vietnam and WA
13 Nov 2024	Stuart Jeffries	Some Aspects of Radioac9ve Minerals Found in WA
22 Jan 2025	Olga Blay	The Ozernovskoe epithermal Au-Ag deposit, Kamchatka
12 Mar 2025	Dr Léonie Rennie	Black diamonds and carbonados: A mineralogical biography
14 May 2025	• Stephen Turner • Craig Bosel	• Minerals of the Fukushima Prefecture, Japan • Tallering peak iron ore mine - quartz crystals, Mount Gibson, Western Australia

21 Jul 2024	Mineral Market - John Mill
11-13 Oct 2024	PGMS
15-17 Nov 2024	Mukinbudin Field trip – Peter Pring
22 Feb 2025	*Desert Fire Designs* workshop – Murray Thompson
12 Apr 2025	Mineral Market - John Mill
2-4 May 2025	Mukinbudin Field trip – Peter Pring

INTRODUCTION TO MINERALOGY COURSE

13 July – Definitions of mineralogy, minerals and rocks, and the physical properties of minerals
10 August – WAM Boola Bardip
14 September – Granite outcrops at Toodyay.
12 October – a browse and study of PGMS specimens and gems
9 November – Visit to the Perth Core library
14 December – A field trip to beach and Canning River outcrop.
8 February – Seminar at the Gemmological Association of WA
8 March – Revision and mineral quiz fun; metallurgy and a special mineral research project.
12 April – Curtin University laboratory visit
10 May – A walk around Perth CBD (dimension stones)
14 June – Visit to MinSocWA's patron collection

Treasurer report - Financial year 2024-2025

Income and Expenditure Summary Statement 1/7/2024 - 30/6/2025

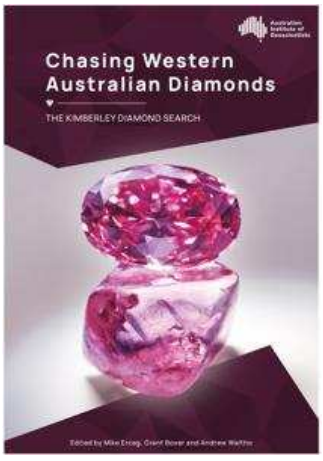
Opening Balance 1/7/2024		$51,320.07	
Income			
	Auction Takings		$171.00
	Donations		$13.98
	Door Takings- Mineral market		$1,647.55
	Membership Fees		$3,918.71
	Book purchase income		$240.00
	PGMS Income		$110,829.43
			$116,820.67
Expenditure			
	Bank Fees and Charges		$64.70
	Book Purchase		$1,633.00
	Gifts		$248.30
	Insurance		$3,671.03
	Mineral market costs (incl. banner)		$1,817.97
	MinSoc costs (Hall hire, software, website)		$984.85
	PGMS Expenses		$134,043.31
	Subscriptions		$388.74
			$142,851.90
Closing Balance 30/6/2025		$25,288.84 Variance $0.80	

NB gross figures for the PGMS includes the 2024 PGMS and the 1st installment payment for PCEC - $15765.75 (PGMS 2025)
Total Net income for the PGMS 2024 was $16922.38

Term deposit	Term deposit at CBA - interest of $1764.82 reinvested on 20/01/2025 - matures on 20/09/2025	$41,764.82
Liability	PCEC final payment (PGMS)	$15,765.75
Total Assets	$51,287.91	

Chasing Western Australia Diamonds

Compiled by Wendy Hampton
Photos by Grant Boxer unless otherwise noted



AIG Published 2025

The talk by Grant Boxer drew a good crowd to hear of his adventures exploring for diamonds in the northern parts of WA. Grant knows this topic very well having been employed to explore for diamonds in the Argyle/Ellendale area (in particular) for over 10 years from the late 1970s.

Grant explained the various types of diamonds sourced from the volcanic rocks we usually assoicate with diamonds; kimberlite and lamproite. Diamonds can also be sourced from high-grade metamorphic rocks and meteorite impacts. Kimberlite rocks contain the most economic diamonds. The Argyle diamonds, unusually, are hosted within a lamproite and even more unusal, an olivine-rich lamproite.

The first diamonds found in WA were during alluvial gold exploration in the Pilbara area of Nullagine in 1895, even though no kimberlites were found. Only a few hundred stones up to 3.16 carats have been found here.

The main exploration drive for diamonds in WA occurred in the late 1960s to early 1970s in the West Kimberley region leucite lamproites, due to Professor Rex Prider's prediction that lamproites are related to kimberlites.

From Boxer et al 2017

Grant informed us that the push for exploration started in earnest with the JV partnership called KJV. Read Stuart Kell's book *Argyle – The Impossible Story of Australian Diamonds* for the full details. KJV exploration located indicator minerals and diamonds during wide-spaced stream sampling.

The first diamond was found in the North Kimberley during 1972-1973. They found kimberlites in the area but it was low grade to barren material.

In 1977, full management was taken on by CRAE after joining the JV in 1976. Exploration focused on the Kimberley Basin due to the potential of old ancient crust, based on the South African diamond model. Sample size was increased from 8 kg to 40 kg to improve the chance of catching indicator minerals of pyrope garnet and picroilmenite.

Grant joined CRAE in 1978, and after various regional sampling campaigns from Derby to Halls Creek, was sent to Diggers Rest field camp in August 1979 to … wait to peg Argyle ...

Intrigue was in the air because Frank Hughes, a CRAE senior geologist, had located the source of the diamonds, but had to wait, since half the Argyle pipe was covered by a uranium temporary lease held by Uranerz, that was due to expire in October.

In the West Kimberley, the lamproites are located in mobile zones (orogenic belts) around the edges of the Kimberley Basin, in buckled and deformed rocks. This resulted in the mobile zones being upgraded to high priority from the previous low priority, hence Argyle could have been missed as it was nearly the last area to be sampled.

The Argyle mine is hosted in an olivine lamproite diatreme dated at about 1200 million years, measuring approximately 2 km long by 500 m wide. Being surrounded by hard sandstone has limited the amount of erosion. Mining took out the near surface lamproite with over 750 million carats of diamonds recovered, until going underground up to late 2020.

Laboratory experts trained to identify diamonds and the indicator minerals pyrope garnet, picroilmenite and chromite in the tiny grains were thorough and experienced. In particular, magnesiochromite was the main mineral to look for, with its 'satin' sheen.

A Lab view of tiny grains 0.3 mm *to 1 mm in size peppered with indicator minerals. Photo Lynda Frewer*

Ellendale Diamonds

Chasing diamonds improved when Chris Smith, from CRAE, was sampling loam near Leopold Down station in 1977 and indicator minerals phlogopite and chromite were identified, leading to several small lamproite pipes being found, as well as diamonds. Thereafter, chromite was included in all analysis, and by following this trail, along with other indicator minerals, resulted in the discovery of the Ellendale diamond field.

It is interesting to note that, in 1974, Grant was exploring for diamonds with the Exoil-Transoil consortium (based in Victoria) around the Ellendale area, and they saw anomalies in the airborne magnetic surveys that we now know to be the lamproite pipes of the Ellendale field – but these were not followed up in the field at that time.

The discovery of chromite being a good indictor mineral revolutionised diamond exploration. De Beers was aware that lamproites can contain diamonds (e.g. Zambia) but this wasn't widely known, and in any case, De Beers considered these deposits uneconomic.

Exploration included the shark and crocodile infested waters of the Cambridge Gulf, where Tony Gates (left below) and crew caught some diamonds washed down the Ord River from Argyle. Since the top of the Argyle pipe has eroded, there are about one million diamonds - somewhere! (Obviously, field work PPE has changed since then).

< Photo by Tony Gates

< Photo by Greg Owens

Below Photo by Chris Smith

The mobile zone near Windjana Gorge was sampled by CRAE and showed indicator minerals. Frank Hughes followed this up and discovered Ellendale No 4 in an olivine-rich lamproite pipe. Olivine rich rocks are usually poor prospects for diamonds – but not here. These diamond-bearing olivine-rich lamproites easily weather forming clay pans in small depressions. Explorers look in the hills for diamonds – but not here.

Two pipes at Ellendale were most productive, although grades were not high enough to warrant the cost of mining. Later, Kimberley Diamonds acquired the area and mined both pipes 4 and 9 until the mine closed in 2015. Tiffany's Jewellers had an exclusive contract with Kimberley Diamonds for the Ellendale yellow diamonds.

Be sure to read the two books mentioned for more exciting revelations about Argyle and Ellendale diamonds.

Fancy yellow diamonds, Ellendale Pit 9. Photo Kimberley Diamond Company

Diamond from near the Argyle pipe.
Photo John Chapman

Ellendale Pipe 9 diamonds.
Photo Kimberley Diamond Company

Ellendale J Channel alluvial diamonds located between the rich Pit 4 and 9.
Photo Kimberley Diamond Company

Typical run-of-mine production at Argyle. Overall low grades, but with rare pinks and higher-grade diamonds making it famous. Photo John Chapman

MICROSCOPE CORNER

Investigations on opaque specimens

Submitted by Susan Stöcklmayer

Two widely different examples of opaque minerals attracted my attention during the last year or so.

Pyrite crystals from Navajun, Spain

A few years ago, handsome specimens of pyrite crystals in host rock that were brought from Spain by one of our members were available to Society members at one of our auction and mineral fairs. One striking example is shown in Figure 1.

Figure 1. Pyrite cube approx. 30 mm^3

Despite a remark in Mindat stating:

"Special Storage/Display Requirements: Stable, no breakdown problems."

Perhaps this remark concerned only the pyrite crystals. Collectors of these pyrite-in-host rocks from this area of Spain should reinforce the host portions of specimens from time to time or risk disaster as happened to one of my personal specimens as shown in Figure 2.

Figure 2. Pyrite crystals in the collapsed host rock. Largest pyrite on left approx. 30 mm across

Figure 3. Rock socket of a 'lost' pyrite crystal

The pyrite crystals from Navajun region of northern Spain attain large sizes (Figure 1, with a crystal of 30 mm^3, is an example) and are predominantly of cuboid habit with smooth non striated surfaces, some show multiple cubic intergrowths. The crystals occur irregularly, and usually singly, in the host rock and are visually very attractive, and it is somewhat surprising to see large and perfectly developed crystals precariously exposed on the rock. However, because of the nature of the host rock it seems many crystals are actually glued in place, from a socket where it formed but having fallen out on a previous occasion. Glue is evident along the edges of many of these crystals. Figure 3 shows a 20 mm^3 rock socket where pyrite was originally formed.

The rock is a soft and fissile host, described as a metapelite and formed by low grade metamorphism of calcareous marl. It is light brown in colour and spotted with white pearly patches of a micaceous mineral. Calcite is common in the mineral composition of the rock, with effervescence seen from the reaction of dilute HCl on the rock surface. Mineralogical composition of the host rock varies with precise location but is described as containing: clays (kaolin and others), cookeite, quartz, calcite and minor mineralogy.

Visual inspection of a crush of the host rock under the petrological microscope is of a fine-grained mix with only the platelets of larger cookeite and grains of calcite resolvable by standard optical mineralogical methods. The finer accompanying minerals are clays.

The formation of the pyrite crystals is attributed to sulphidation of chlorite and is described in the reference (Alonso-Azca *et al*. 1999).

This reference describes clean surfaces of the pyrite crystals; but adds that *"they contain a high density of inclusions, mainly of phyllosilicates (illite and chlorite), quartz and tabular crystals of chloritoid. Occasionally inclusions of calcite, dolomite, anhydrite, chalcopyrite, sphalerite and iron oxides are found.* Figure 4 shows a group of the loose pyrite crystals the largest is 30 mm^3.

Figure 4. Pyrite crystals

Hollandite in amethystine quartz

Transparent quartz is well-known as a host to a great variety of mineral inclusions; at Tucson 2024 some interesting amethystine-coloured quartz with hollandite inclusions was introduced to the market.

Hollandite is a monoclinic manganese mineral with formula $Ba(Mn^{4+}{}_6Mn^{3+}{}_2)O_{16}$ usually of prismatic habit and often finely fibrous with sharp terminations. It is described as opaque, of metallic lustre and silver-black in colour. Hollandite inclusions in quartz are not common and have been previously investigated in gemstone studies in other varieties of quartz (rock crystal- colourless quartz) under the trade name "spider quartz", sourced from Madagascar (Fritsch, 2001). Identification of mineral inclusions enclosed by a host mineral is not easily achieved; in this case these hollandite inclusions were exposed by breaking the specimen. The chemical composition (semi quantative) was measured with the EDX spectrometer of the SEM and confirmed by X-ray diffraction analysis.

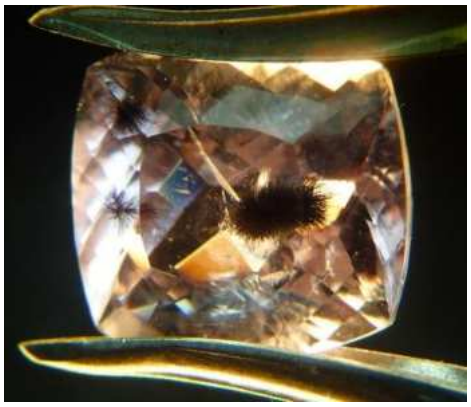


Figure 1. Quartz gemstone with inclusions of hollandite

Figure 2. Hollandite inclusions quartz gemstone

The hollandite in quartz from Tucson is shown in Figures 1 and 2 in a 3.8 ct faceted specimen measuring 10 mm x 9.4 mm. This quartz is a light purple and brownish colour and sourced from the Bahia State of Brazil. The identity of hollandite was confirmed by a non-destructive approach (Paglialunga 2020-2021). This reference was not available online and is cited in Lars and Renfro (2024).

Inclusions hosted by transparent minerals present a micro world of interest and examination of inclusions requires magnification to appreciate the beauty of crystal habits.

Alonso Azca J., Rate I., Rodas M., Bottrell H., Raiswell R., Velasco F., and Mas J., 1999. Pathways and distances of fluid flow during low-grade metamorphism: evidence from pyrite deposits of the Cameros Basin, Spain, *Journal of Metamorphic Geology* 17 pp. 339-348.

Fritsch E., 2001. "Spider" quartz, *Gems and Gemology* 37 (3) pp. 238.

Lars B., and Renfro N., 2024. Quartz from Brazil with hollandite inclusions, *Journal of Gemmology* 39 (4) pp. 304-305.

[*Reference contained in Lars (2024).* Paglialunga G., 2020-2021. L'archeogemmologia e lo studio delle inclusioni su gemme: Un approccio non distructtivo per risalire alle antiche rotte commerciali Bachelor's thesis, Sapienza University of Rome, Italy 51 pp.]

MinSocWA – 25 YEARS OLD in 2025

This year is our 25th anniversary. Niels Dahl, Vernon Stöcklmayer and Angela Riganti have taken on the task of compiling an historical record of the past quarter century.

We wait with anticipation to read our quarter century history at the event on 28 October 2025, or after.

$20 per person. See October Bulletin for link (members only)
28 October 2025 doors open at 7.00 pm – until late
Verandah Bar, Inglewood Hotel, cnr Beaufort St and Fifth Ave, Mount Lawley

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MEMBERSHIP

The Mineralogical Society of WA has over 100 members. We have welcomed the following new members since June 2025:

Amanda E	Renee W
Omni and Saroj S	Debbie B
Mike G	Mary S

(Apologies to Caroline L for the typo in her name in the previous Q2 newsletter)

All members are asked to ensure that their contact details are up to date with the Membership Secretary/Secretary. If you change your email address or phone number, please let us know so that you continue to receive all MinSocWA communications – membership@minsocwa.org.au

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FROM YOUR LIBRARY READY TO BORROW

The MinSocWA Library has recently received the following items:

Hard copies of the following journals: *The Mineralogical Record, Santa Rosa! July – August 2025, Vol. 56, No. 4* and *Rocks and Minerals July – August 2025, Vol. 100 No. 4*. Both volumes are now available for loan either at a general meeting or by request to the librarian.

The main article in *The Mineralogical Record* by Carlos Cornejo and Odúlio José Marensi de Moura concerns the '**Santa Rosa Pegmatite District, Franciscopolis, Minas Gerias, Brazil**'. This mining district was in its heyday from 1967 to the mid 1970's, when it produced extraordinary tourmalines of exceptional quality in large, multicoloured crystals. The Santa Rosa Mine came to be considered one of the most important tourmaline occurrences, producing specimens that are now the pride of important museums and private collections around the world.

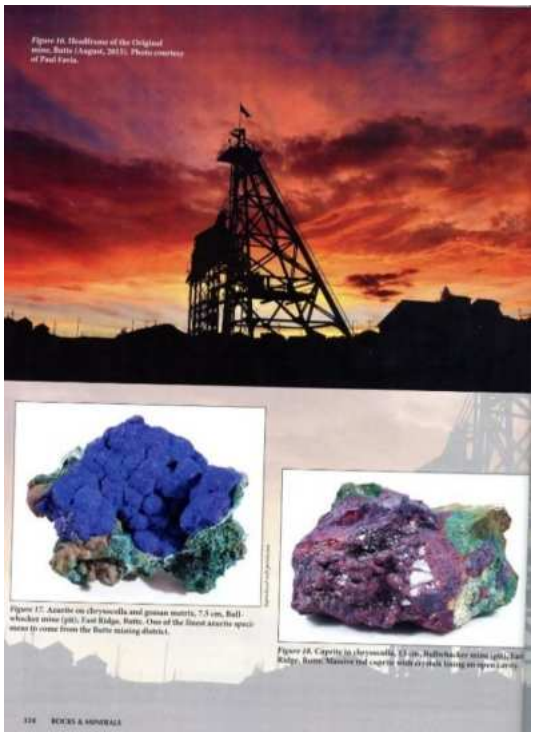
The article details an extensive history of mining and exploitation of the Santa Rosa Area and particularly the Santa Rosa Pegmatite. Tourmaline bearing pegmatites intrude the São Tomé Formation which consists of a sandy-pelite-carbonate sequence metamorphosed to quartz-biotite schists and gneisses.

The pegmatites are of the LCT (Lithium-Cesium-Tantalum) family granitic type of Neoproterozoic age (600 – 400 million years). The pegmatites are distinctly zoned, lenticular in shape and variable dips. Multicoloured tourmaline occurs with quartz, albite and lepidolite in diverse aesthetic arrangements. This article is well worth a read.

The lead article in *Rocks and Minerals July – August 2025, Vol. 100 No. 4* is entitled '**Minerals from the Historic Mines of Butte, Montana'**, by Daniel Evanich.

The Butte mines, located in Montana, USA, have been operational for over 125 years. Over the years, the miners have created over 10,000 miles of underground tunnels and two very large open pits. Today, only the Continental Open Pit is in operation, producing 0.3% Cu and 0.1% Mo. From over 15,000 men employed in underground operations between 1915 and 1918, only about 390 are currently employed at the Continental operation today.

The mineralization occurs in veins which when eroded gave rise to gold placers which led to the discovery of the primary ore deposits. The deposit is zoned and consists of a Central Zone containing quartz, pyrite, chalcocite and enargite veins. Next comes the Intermediate Zone which has a wider range of minerals than the Central Zone, with the addition of tennantite, fluorite and calcite. This is followed by the peripheral Zone where the mineralization is mainly zinc, manganese and silver minerals. Mineral species include sphalerite, rhodochrosite, silver, galena, rhodonite, quartz and calcite. There is also a deep zone below 2,800 feet where molybdenum was found and this mineralization is currently mined in the Continental Pit where it has been uplifted by faulting.



Today, few, if any collectable minerals are to be found at Butte. The treasure now resides in Museums and private collections in the USA and around the world.

Left: The headframe of the original mine at Butte, Montana and a few of the secondary copper minerals extracted from the mine.

UPCOMING EVENTS

MinSocWA 25th Anniversary celebration
Purchase ticket at $20 per person – see October Bulletin for link (members only).
28 October 2025 doors open at 7.00 pm – until late
Verandah Bar, Inglewood Hotel, cnr Beaufort St and Fifth Ave, Mount Lawley

The Perth Gem and Mineral Show (PGMS)
7th – 9th November 2025
https://www.perthgemmineralshow.com/

PGMS
Perth Gem & Mineral Show
Proudly presented by the Mineralogical Society of Western Australia

The Perth Gem and Mineral Show (PGMS) sub-committee is pleased to report that planning of the inaugural show is going ahead smoothly. The event will showcase many of the wonders that the mineral, gem, fossil and geoscience communities have to offer, with a special focus on Western Australia's mineral heritage.

Note: There is no meeting on Wednesday 12 November 2025 due to:
Saturday 22 November 2025 - Bunbury field trip and presentation

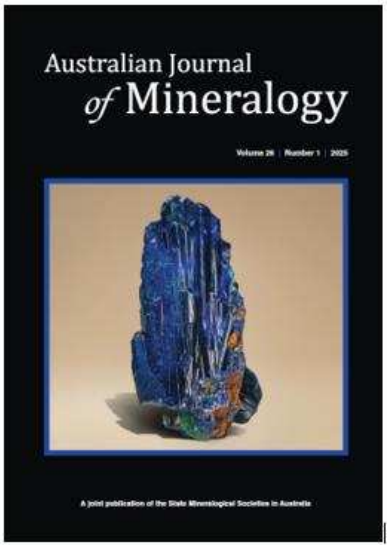
ASSISTANCE REQUIRED

Volunteer Opportunity Australian Journal of Mineralogy

The Australian Journal of Mineralogy (AJM) is seeking a part-time volunteer secretary to join a small Committee of enthusiasts in their efforts to promote mineralogical research and understanding.

The AJM is a high-quality, lavishly illustrated scientific journal that is published twice a year and is marketed to Australian and international subscribers. As a committee member, you would contribute to some of the journal operations, managing correspondence and assisting with other administrative tasks.

If you feel that you have the skills and interest to be able to contribute and would like further information, please contact us at ajmin.editor@gmail.com www.AJMin.org.au



COMMITTEE MEMBERS FOR 2025/2026

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Vice President		
Acting Secretary	Angela Riganti	secretary@minsocwa.org.au
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Assisting positions:		
Membership Secretary	Wendy Hampton	membership@minsocwa.org.au
Newsletter Editor	Wendy Hampton	newsletter@minsocwa.org.au

Patron - *Mark Creasy*

Meetings

Meetings of the Mineralogical Society of Western Australia Incorporated are usually held at **7.30 pm on the second Wednesday of every odd month**[1] at:

WA Lapidary & Rockhunting Club rooms 31 Gladstone Road,
Rivervale (corner of Newey Street)

The venue will be open from 6.30 pm for refreshments and socialising.
[1] Note the January meeting is usually the 3rd Wednesday. Note the November 2025 meeting is cancelled due to the Bunbury trip.

MinSoc WA LINKS

Web	http://www.minsocwa.org.au
Facebook Group	https://www.facebook.com/groups/minsocwa
Facebook Page	https://www.facebook.com/MINSOCWA
Instagram	https://www.instagram.com/MINSOCWA
YouTube Channel	https://www.youtube.com/channel/UC0S2TFVFIBLU-2zlEzE5VNA

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