

The ARABIAN-NUBIAN SHIELD

The **Arabian–Nubian Shield (ANS)** is one of the world's most **under-explored yet mineral-fertile Precambrian terranes**, and it presents **exceptional geological and commercial opportunities**.

1. Why the ANS is Geologically Special

Age & Tectonic Setting

- Neoproterozoic ($\approx 900\text{--}550\text{ Ma}$)
- Juvenile crust formed by **arc accretion, ophiolite emplacement, and post-collisional magmatism**
- Minimal Phanerozoic overprint → **ore systems preserved and shallow**

Key Advantage

➡ Comparable in scale and fertility to the **Canadian Shield**, but with:

- Far less historical exploration
 - Extensive under cover but shallow mineralisation
 - Increasing government support (esp. Saudi Arabia, Egypt)
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2. Tier-1 Geological Opportunities by Deposit Type

A. Orogenic Gold (Major Opportunity)

Why it matters

- World-class analogue to Abitibi & Yilgarn
- Hundreds of known occurrences, few modern mines

Controls

- Shear zones
- Greenstone belts
- Quartz–carbonate veins
- Late transpressional structures

High-potential areas

- Egypt (Eastern Desert)

- Sudan (Nubian Shield)
- Saudi Arabia (Jabal Ishmas–Wadi Tathlith belt)
- Eritrea

Opportunity

- ✓ District-scale shear corridors
 - ✓ Bulk-tonnage + high-grade shoots
 - ✓ Near-surface, low strip potential
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B. VMS (Cu–Zn–Au–Ag)

Why it matters

- ANS is **rich in arc-related volcanics**
- Many deposits discovered, few fully drilled

Typical hosts

- Bimodal volcanics
- Island arc sequences
- Back-arc basins

Examples

- Bisha (Eritrea)
- Jabal Sayid (Saudi Arabia – Cu-rich VMS/mafic hybrid)

Opportunity

- ✓ Camp-scale VMS belts
 - ✓ Modern EM + gravity under cover
 - ✓ Polymetallic upside (Au credits often ignored)
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c. Intrusion-Related Gold & Cu–Au Systems

Emerging opportunity

- Late/post-orogenic granitoids
- Reduced intrusion-related gold (RIRG) analogues
- Hybrid porphyry–orogenic systems

Why underexplored

- Historically classified as “barren granites”
- Limited geochemistry and age dating until recently

Opportunity

- ✓ Large tonnage, moderate grade
 - ✓ Bulk open-pit targets
 - ✓ Good fit for modern processing
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D. Porphyry Cu–Au–Mo (Selective but Strategic)

Reality check

- Fewer Tier-1 porphyries than Andes
- But **fertile arc segments exist**

Best settings

- Late arc to post-collisional intrusions
- Preserved volcanic cover
- Structural intersections

Saudi Arabia & Egypt

- Now prioritised under national mineral strategies

Opportunity

- ✓ Strategic metals (Cu, Mo)
 - ✓ Government-backed exploration
 - ✓ District-scale alteration footprints
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E. Critical & Specialty Metals (High-Upside)

Includes

- Tin–tungsten (Sn–W)
- Tantalum–niobium (Ta–Nb)
- Rare earths (REE)
- Lithium-bearing pegmatites (emerging)

Controls

- Highly fractionated granites

- Pegmatite swarms
- Shear-controlled emplacement

Opportunity

- ✓ Early-stage, low competition
 - ✓ High strategic value
 - ✓ Ideal for small-to-mid cap developers
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3. Structural & Regional Upside (Often Missed)

Major opportunity lies in:

- Re-interpreting **regional shear systems**
- Linking ophiolites, arcs, and granitoids into **mineral systems**
- Applying **modern terrane analysis** rather than deposit-by-deposit targeting

 Many known deposits are **leakage from larger systems not yet found**

4. Why the ANS Is Ripe Now

Technical

- Modern geophysics (AEM, gravity)
- Better geochronology & isotopes
- Improved arid-terrain geochemistry

Political / Commercial

- Saudi Arabia Vision 2030
 - Egypt mining law reform
 - Red Sea corridor infrastructure
 - Strategic metals demand (Au, Cu, W, REE)
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The Arabian–Nubian Shield is:

-  One of the **last great under-explored Precambrian shields**
-  Proven for **gold, base metals, and critical minerals**
-  Structurally complex but **geologically simple enough to model**
-  Entering a **golden window of political and investment support**