



Maden Jeologları Derneği



Maden Aramacılığında Teknolojik Gelişmeler

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İletişim ve İSG Paylaşımı: Yeni Nesil Uydu Telefonları ve GPS'ler



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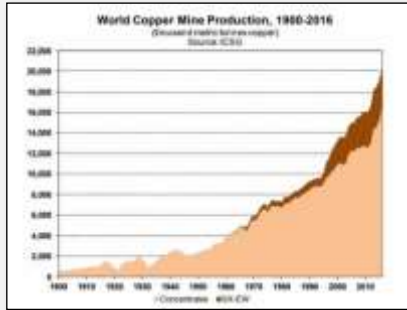
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Teknolojik Gelişmelere Neden İhtiyaç Var?



- Nüfus artışı, kentleşme ve sanayileşme talebi sürekli artırmaktadır
 - 1990-2010 yılları arasında kişi başına yıllık bakır ve çelik tüketimi 10 kat artmıştır
 - 21. yy'da Cu, Li, Co, Ni, NTE, gibi yeşil teknolojilerde kullanılan metallere olan talep hızla artmıştır.
- Buna paralel olarak maden arama harcamaları da aynı oranda artmıştır
- Ama maden keşfi sayısında aynı oranda artış olmamıştır, bu da birim buluş maliyetinde yükselme olduğu anlamına gelir.



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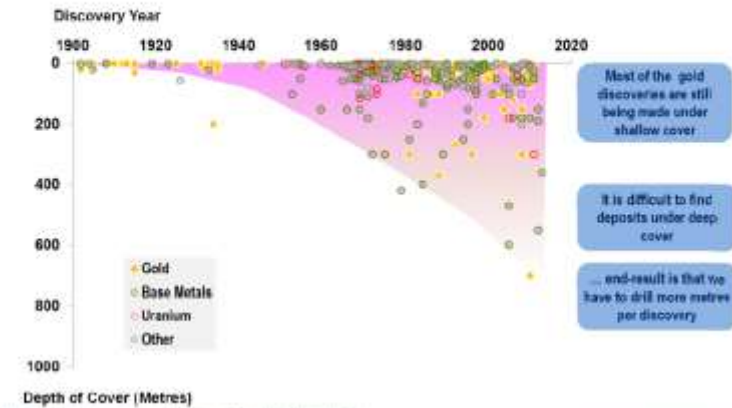


Maden Aramalarında Yenilikçi Çözümlere Neden İhtiyaç Var?



Why is innovation in exploration required?

Depth of cover for discoveries in Australia: 1900-2013



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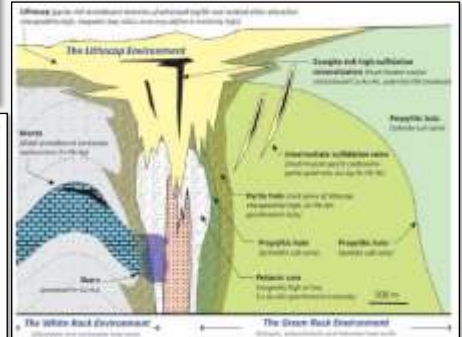
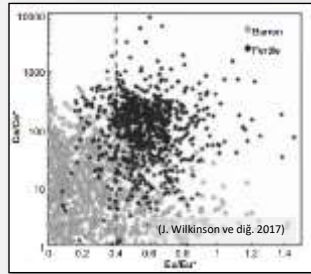
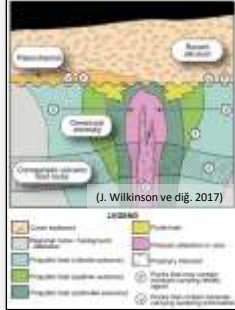
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Jeokimya



- Analiz teknolojisindeki ilerlemeler
 - ICP-MS, LA-ICP-MS
 - Hareketli Metal İyonları (MMI)
- Jeokimyasal ayak izi (yakınlık-uzaklık)
- İzotop jeokimyası (Örnek: Zr) ve doğurganlık (fertility)



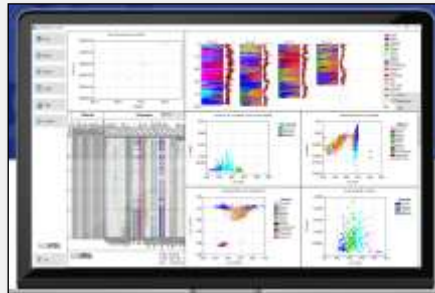
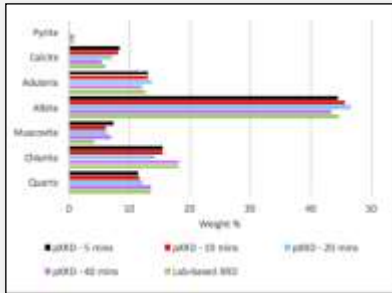
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Jeokimya



- Taşınabilir Mineralojik ve Jeokimyasal Analiz Cihazları
 - PIMA/ASD (alterasyon mineralleri tanımlaması)
 - XRF (elementel kompozisyonu belirleme)
 - XRD (mineral %)
- SEM, TIMA, QEMSCAN, MLA – Otomatik Mineralojik Analizler



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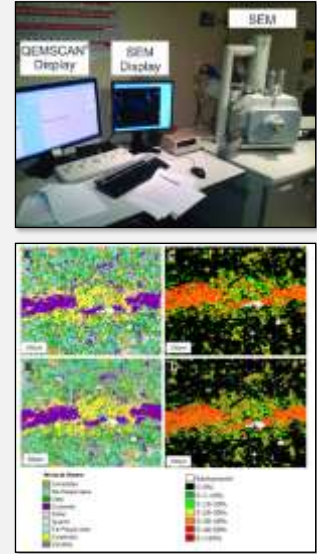
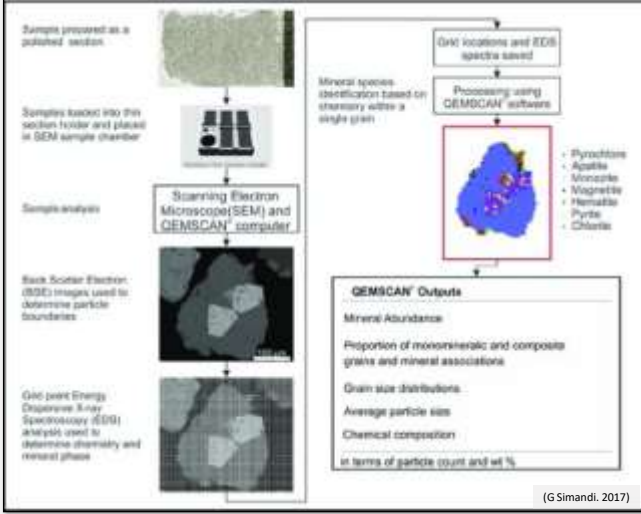
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Jeokimya



- SEM, TIMA, QEMSCAN, MLA – Otomatik Mineralojik Analizler



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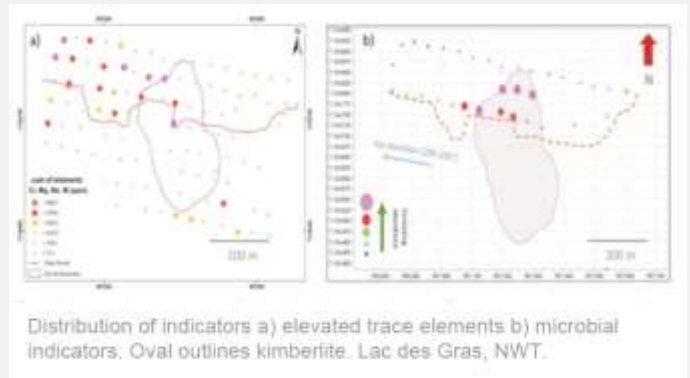
Geomicrobiology & Biogeochemistry



- Toprak Örneđi
 - Biyoloji
 - Genetik Teknoloji
 - Bilgisayar Bilimi
- Topraktaki mikrobik türlerinin miktarı ve çeşitliliđi
- İstatistiksel Analiz



Typical B soil horizon for sampling



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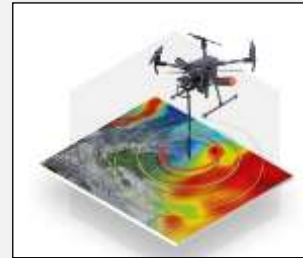
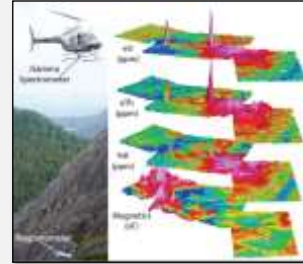
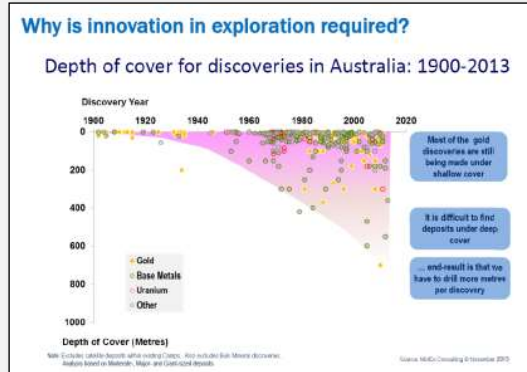
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Jeofizik



- Havadan elektromanyetik
- Havadan gravite
- Havadan manyetotellürik (MT)
- 3D sismik



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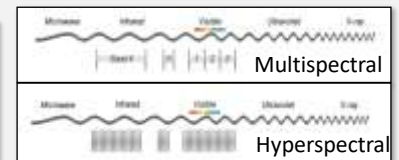
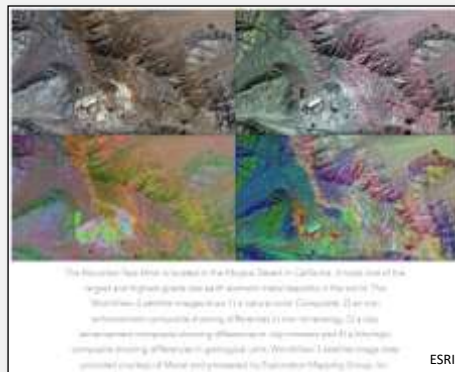
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Uydu Teknolojisi ve Uzaktan Algılama



- Çözünürlük (30m x 30m / 1.2m x 1.2m)
- Multispectral and hiperspectral görüntüleme (Alterasyon vs)
- LIDAR
- İHA



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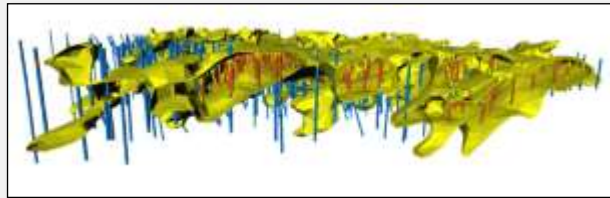
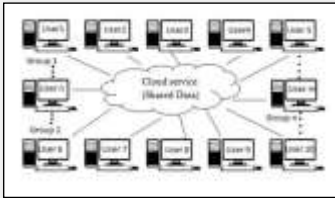
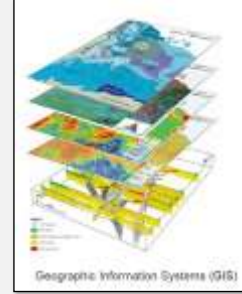
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Veritabanı vs CBS



- Bulut tabanlı güvenilir veritabanı
 - Maliyet etkinliği
 - Düşük Bakım masrafı
 - Çoklu kullanıcı ulaşımı ve yetki dağılımı
 - Güvenilir
 - Data kaybolma problemi olmayan
- Yeni yazılımlar
- 3B



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Dijital Haritalama



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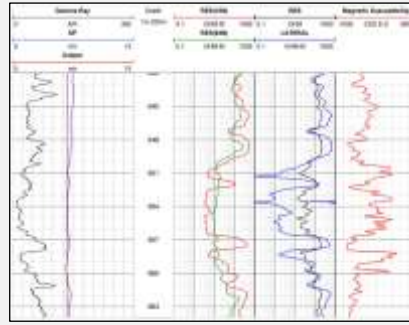
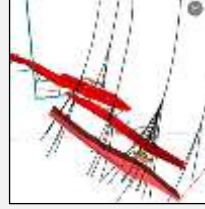
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Sondaj Teknolojisi



- Kuyu İçi Görüntüleme ve Loglama Sistemleri
 - Gamma Ray (killer, şeyl vs)
 - IP
 - Optical/Acoustic Televiever (yapısal analiz)
- Yönlü Sondaj
- Sonik Sondaj
- Sarmal Boru Sondaj



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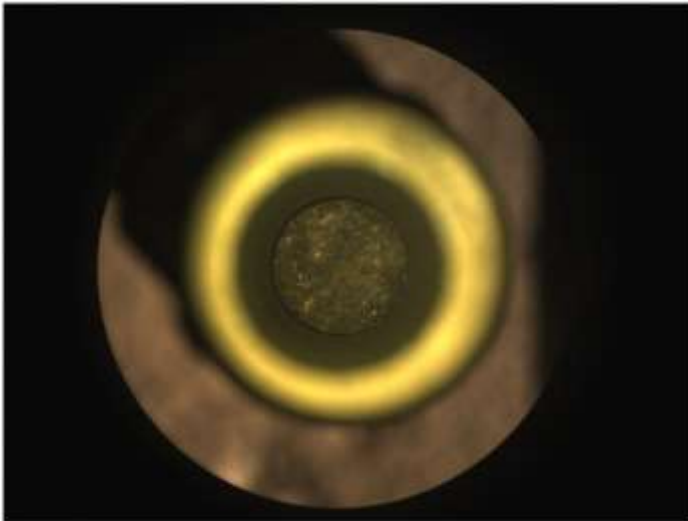


Sondaj Teknolojisi



Success! Mars rover finally collects its first rock core

NASA's Perseverance rover finally got its name, drilling and storing Martian rock after a nearly 4-year quest.



The Perseverance rover's first intact rock core was visible inside its sample tube, just before the tube was sealed on 5 September. Credit: NASA/JPL-Caltech



A borehole was visible on the rock Rockette after drilling. Credit: NASA/JPL-Caltech



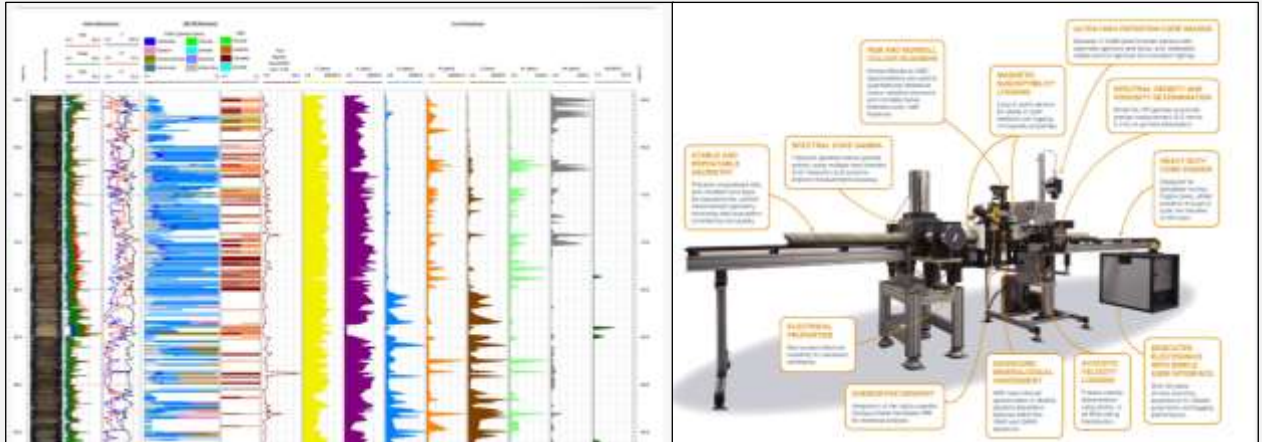
The rover drilled into Rockette on 5 September. Credit: NASA/JPL-Caltech

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Otomatik Spektroskopik Loglama

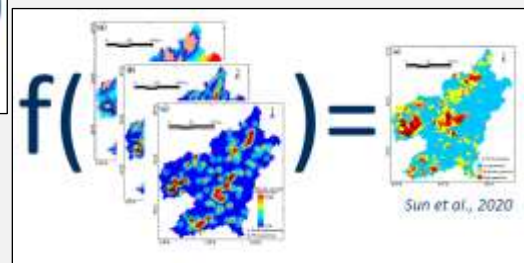
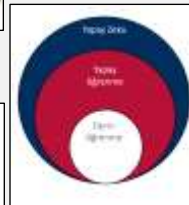
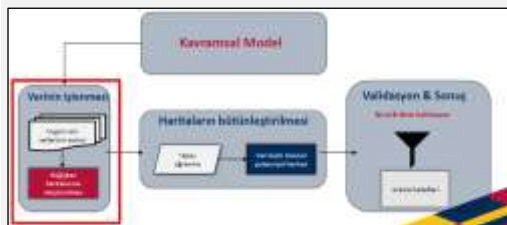
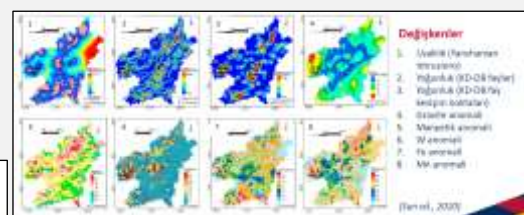
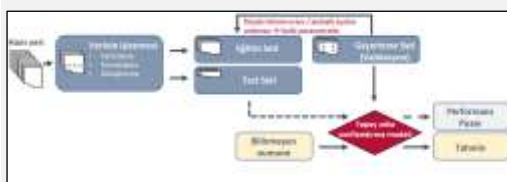


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Yapay Zeka ve Makine Öğrenimi



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Yararlanılan Kaynaklar



- Cucuzza, J., 2016, Innovation in mineral exploration: Advances in mineral exploration research, Prometia science seminar, Amira
- Özkan, Y. Z., 2022, Maden aramalarında yenilikler, MTA sunum
- Thompson, A.J.B., 2020, Innovation in mineral exploration, PDAC

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