Evaluate the following abstracts by identifying their component parts:

**Ages for Australia’s oldest rock paintings**Nat Hum Behav (2021). https://doi.org/10.1038/s41562-020-01041-0

Naturalistic depictions of animals are a common subject for the world’s oldest dated rock art, including wild bovids in Indonesia and lions in France’s Chauvet Cave. The oldest known Australian Aboriginal figurative rock paintings also commonly depict naturalistic animals but, until now, quantitative dating was lacking. Here, we present 27 radiocarbon dates on mud wasp nests that constrain the ages of 16 motifs from this earliest known phase of rock painting in the Australian Kimberley region. These initial results suggest that paintings in this style proliferated between 17,000 and 13,000 years ago. Notably, one painting of a kangaroo is securely dated to between 17,500 and 17,100 years on the basis of the ages of three overlying and three underlying wasp nests. This is the oldest radiometrically dated in situ rock painting so far reported in Australia.

**Dancing Volvox: Hydrodynamic Bound States of Swimming Algae**

Phys. Rev. Lett. 102, 168101 (2009)

The spherical alga Volvox swims by means of flagella on thousands of surface somatic cells. This geometry and its large size make it a model organism for studying the fluid dynamics of multicellularity. Remarkably, when two nearby Volvox colonies swim close to a solid surface, they attract one another and can form stable bound states in which they “waltz” or “minuet” around each other. A surface-mediated hydrodynamic attraction combined with lubrication forces between spinning, bottom-heavy Volvox explains the formation, stability, and dynamics of the bound states. These phenomena are suggested to underlie observed clustering of Volvox at surfaces.

**Graphene based Supercapacitors with Improved Specific Capacitance and Fast Charging Time at High Current Density** http://arxiv.org/abs/1311.1548

Graphene is a promising material for energy storage, especially for high performance supercapacitors. For real time high power applications, it is critical to have high specific capacitance with fast charging time at high current density. Using a modified Hummer’s method and tip sonication for graphene synthesis, here we show graphene-based supercapacitors with high stability and significantly-improved electrical double layer capacitance and energy density with fast charging and discharging time at a high current density, due to enhanced ionic electrolyte accessibility in deeper regions. The discharge capacitance and energy density values, 195 Fg-1 and 83.4 Whkg-1, are achieved at a current density of 2.5 Ag-1. The time required to discharge 64.18 Whkg-1 at 5 A/g is around 25 sec. At 7.5 Ag-1 current density, the cell can deliver a specific capacitance of about 137 Fg-1 and maintain 98 % of its initial value after 10,000 cycles, suggesting that the stable performance of supercapacitors at high current rates is suitable for fast charging-discharging applications. We attribute this superior performance to the highly porous nature of graphene prepared with minimum restacking due to crimple nature wrinkles and the improved current collecting method.

**Quinacrine Sterilization and Gynecologic Cancers: A Case-Control Study in Northern Vietnam**

Sokal, et al; Epidemiology 21(2):164-171

Over 100,000 women worldwide have been sterilized by insertion of quinacrine into the uterus to induce tubal scarring. Concern has been expressed about possible carcinogenicity, and specifically the risk of uterine cancer. From 2001 through 2006, we conducted a population-based, case-control study of gynecologic cancers in 12 provinces in northern Vietnam, where relatively large numbers of women had received quinacrine. Cases of incident cervical, ovarian, and uterine cancer were identified at provincial hospitals or at referral hospitals in Hanoi. For each case, 3 age- and residence-matched controls were randomly selected from the population registries of the case’s home community. The prevalence of quinacrine exposure was 1.2% among cases and 1.1% among controls. For cervical cancer, analysis of 606 cases (9 exposed) and their 1774 matched controls (18 exposed) produced an odds ratio of 1.44 (95% confidence interval = 0.59-3.48) (adjusted for several covariates including human papillomavirus risk score). For ovarian cancer, based on 262 cases (3exposed) and 755 controls (8 exposed) and adjusted for age and number of years of ovulation, the odds ratio was 1.26 (0.21-5.45). For uterine cancer, none of the cases-including 23 cases of leiomyosarcoma-was exposed to quinacrine. The 95% confidence interval, based on 161 cases (none exposed) and 470 controls (7 exposed) and adjusted only for age, was 0-1.85. We found no evidence of a relationship between quinacrine sterilization and gynecologic cancer.

**Early assembly of the most massive galaxies**

Nature 458 p603–606

The current consensus is that galaxies begin as small density fluctuations in the early Universe and grow by in situ star formation and hierarchical merging. Stars begin to form relatively quickly in sub-galactic-sized building blocks called haloes which are subsequently assembled into galaxies. However, exactly when this assembly takes place is a matter of some debate. Here we report that the stellar masses of brightest cluster galaxies, which are the most luminous objects emitting stellar light, some 9 billion years ago are not significantly different from their stellar masses today. Brightest cluster galaxies are almost fully assembled 4-5 billion years after the Big Bang, having grown to more than 90 per cent of their final stellar mass by this time. Our data conflict with the most recent galaxy formation models based on the largest simulations of dark-matter halo development. These models predict protracted formation of brightest cluster galaxies over a Hubble time, with only 22 per cent of the stellar mass assembled at the epoch probed by our sample. Our findings suggest a new picture in which brightest cluster galaxies experience an early period of rapid growth rather than prolonged hierarchical assembly.