

PARFAIT II Round 12

Caltech

Noah Rahman, Yan Zhang, Evan Dummit

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1 Caltech Tossups, Round 12

1. The spectral asymmetry resulting from it is key in the chiral bag model of nucleon mass, and the van der Waals and London dispersion interactions can be understood as analogous to it. It falls off as r^4 , but at sub-micron distances, it is the most powerful force on non-charged conductors. Often explained via an analogy of ships shielding waves from each other and being drawn together by the lack of energy in between, this is, For ten points , what manifestation of zero-point energy caused by conductors and dielectrics changing the vacuum expectation energy of the electric field?

Answer: Casimir effect

2. In what the poet considered his best poem, he wrote “Brute beauty and valour and act, oh, air, pride, plume, here / Buckle!”, which shows strong differences between himself and his contemporary Victorians. In 1888, he wrote a long poem concerning a maritime disaster in which 157 people died, including 5 nuns, which understandably upset this Jesuit priest. Both of those poems employed his unusual meter which stressed the first syllable of each foot, but had variable-length feet, a style he called “sprung rhythm”. FTP, name this poet, best known for “The Windhover” and *The Wreck of the Deutschland*.

Answer: Gerard Manley Hopkins

3. His nickname *Gullintani* means “gold tooth” and reflects the cleanliness of his teeth, in line with his spotless reputation as the White God. He turns himself into a seal to do battle with Loki, resulting in his retrieval of Freya’s seductive necklace *Brisingamen*. Among other surprising attributes, he sleeps less than a bird and can hear the grass growing and the wool growing on a sheep’s back, as well as seeing hundreds of miles away. The slayer of Loki at Ragnarok, this is, for ten points , what sounder of Gjallarhorn, the guardian of Bifrost?

Answer: Heimdall

4. Before this battle, and ambush laid by Laurence Dempsey resulted in a pyrrhic victory because the experienced commander died at Oldbridge a few days later. The ambush was here instead of at Moyry pass upon the advice of Lauzun, who said that the position could be too easily flanked from the Armagh. The attacking force of Dutch, Huguenots, and German mercenaries led by William III scared the shit out of the defending Irish force’s leader, who fled to France. For ten points , name this defeat of the Jacobite forces under James II named for a nearby river.

Answer: Battle of the Boyne

5. Local legend holds that this place was the site of many ancient battles between warring serpent beings, which account for its present appearance. Today, local laws prohibit the photography of certain areas in and around this site, for fear of accidental viewing by Natives, who maintain spiritual ties to it and have gender-specific rituals associated with different areas. The first European to spot this landmark was British explorer Ernest Giles in 1872, though it was William Gosse, a surveyor, who named it after the Chief Secretary of South Australia. For ten points , identify this monolith in the Australian Outback.

Answer: Uluru or Ayers Rock

6. Among the most highly conserved proteins among all species, they are known to occur in six major classes. Phosphorylation of serine residues often is a sign of transcription having occurred. Citrullination, or replacing the imine group of arginine with an oxygen to make a citrulline, has a counterregulatory effect to methylation, which is known to downregulate associated gene expression, while acetylation leads to the formation of euchromatin and unpacking of the companion DNA. Recent epigenetic discoveries have led to a reevaluation of, For ten points , which class of octameric proteins that coil around DNA and lead to nucleosome formation?

Answer: Histones

7. Physical explanations for it include thermodynamical and quantum interactions governing the favorability of photon emission. Recent evidence for its variation rests on measurements of quasar light absorbed by gaseous galactic outskirts, with possible variations in magnesium isotope concentration yet to be ruled out as a bias. A change of 4% in its value would cause star fusion to cease, and the anthropic principle is often invoked to account for its value. Eddington famously devised proofs of its being exactly equal to $1/137$. For ten points , what is this dimensionless physical value fundamental to the nature of electromagnetic forces?

Answer: Alpha or fine structure constant

8. He long claimed that Steven Spielberg's E.T. drew from an unpublished script of his titled *The Alien*. When a student in London, he met Jean Renoir, which inspired him to make films. His most star-studded work, *A Game of Chess*, deals with the life of the Mogul emperor Wajid Ali Shah as the British East India Company usurps his power. However, his Lifetime Achievement Oscar in 1991 was probably motivated more by his six most famous films, the *Calcutta* and *Apu* trilogies. For ten points , identify this famed Bengali filmmaker.

Answer: Satyajit Ray [ROI]

9. He served as a proconsul to Asia Minor under the corrupt Salvius Titianus, and would gain greatest ground in the year of four emperors as a general on Vespasian's side, after his mother Julia Procilla was murdered by Otho. Late in life he was appointed governor of Aquitania, and earlier he had created a line of forts across Britain while serving as its governor. For ten points , this is what Roman general, the father and subject of a biography of Tacitus?

Answer: Gnaeus Julius Agricola

10. These are direct band gap devices, setting them apart from their more common indirect band gap brethren. More exotic varieties can be fabricated using sapphire or diamond, but they normally use gallium nitride and gallium arsenide as substrates. In 1993, Shuji Nakamura of the Nichia Corporation invented a type with a wavelength of 475 nanometers, allowing the production of full color displays by utilizing the green, red, and blue versions of these devices. For ten points , name these special types of diodes, which are more commonly used for their luminosity than for their rectifying properties.

Answer: LEDs or Light Emitting Diodes

11. Known as Hosay among Indo-Trinidadians, it is often celebrated with a *taziyeh* or passion play, and it served as one of the primary focuses for resistance to the Iranian Shah's regime during the 1979 Revolution. It involves a great deal of beating oneself on the chest and is notable for the process of *matam*, or flagellation with knives to show one's willingness to have fought on behalf of a grandson of the Prophet Muhammad. For ten points, name this festival on the tenth day of *Muharram* commemorating the martyrdom of Hussain at Karbala by Yazid's troops.

Answer: Ashura

12. Its counterpart is the theoretically based Eyring equation, which is often used instead of this in non-gas-phase systems. Its pre-exponential constant A consists of a collision frequency z and a steric factor p , which mediates z to describe the amount of effective collisions necessary for producing an effective reaction. It is often applied when plotting slope of the natural logarithm of reaction rate versus the inverse of temperature to define the activation enthalpy for the reaction in question. For ten points, name this equation from chemical kinetics.

Answer: Arrhenius equation

13. George Branković remained neutral during the battle here, and refused to assist the richest landowner in Hungary, who had hoped to meet up with Skanderbeg's forces, but instead Hunyadi faced the 60,000-strong opposing force in a formation similar to Varna alone. This is in contrast to the first battle at this site where Murad II defeated Serbian Prince Lazar's forces, with both perishing in the process. For ten points, name these battles upon whose ground Slobodan Milosevic stood in 1989 and famously reignited Serbian nationalism.

Answer: Battles of Kosovo Polje

14. His fascination with indigenous and Aztec cultures is shown in his short story *Chac Mool*, in which an idol of the title Aztec rain god torments a modern day Mexican before taking his place. In a novella of his, the narrator Felipe is writing a history of General Llorante, whose widow creates the titular spirit girl to seduce Felipe for her. After the enchanted Felipe embraces the widow, she suggestively states that they will together bring back *Aura*. However, he is best known for a novel consisting of varying perspectives and flashbacks on the life of a powerful figure in the Mexican Revolution. For ten points, name this author of *The Death of Artemio Cruz*.

Answer: Carlos Fuentes

15. He played an important role in the Committee of Public Safety during the Revolution, notably signing the death warrant for the father of Napoleon's future wife. His painting *Lictors Bringing to Brutus the Bodies of His Sons* was at first refused a showing in the Salon, causing outrage among the populace, and was seen as a symbol of the then-ongoing Revolution. *Intervention of the Sabine Women* was seen as a plea for post-Revolutionary unity, yet he is probably best known for Revolutionary exhortations such as *Death of Marat*. For ten points, name this French painter of *The Death of Socrates* and friend of Robespierre, who painted Napoleon in many poses.

Answer: Jacques-Louis David

16. Famed for its artistic achievements, including the poetry and paintings of Su Shi, and its refinements in stoneware and porcelain glazes, this Chinese dynasty also saw the introduction of exams for entry to high office. Its cities were the largest in the world at the time, with both Hangzhou and the northern capital at Kaifung boasting populations in the hundreds of thousands. It saw the capture of the entire royal family in 1127 by invading Jurchens, ending the northern version. For ten points, name this dynasty, whose southern edition finally fell to Mongol invaders in 1279.

Answer: Sung Dynasty

17. A 1985 PBS Frontline documentary about it, a *Class Divided*, explored the controversy it caused and its application to prison employees. Pieces of cloth were used to designate the two groups, and four individuals with dyslexia who weren't made to wear the cloth were able to read words they couldn't before, confirming their superiority. The most long standing controversy lies over the age of the subjects and their ability to give consent or not. An exercise by a Riceville, Iowa school teacher used to teach about Martin Luther King Jr.'s death, for ten points, name this study that separated kids based on eye color and told them one group was more intelligent than the other, resulting in persecution.

Answer: Elliott experiment/exercise or Blue eyes/brown eyes (accept either order) exercise

18. Chapter 12, "The Worship of Trees," seems to have little to do with the author's thesis, and it would seem that chapter 15, "The Worship of the Oak," could probably have been combined somewhere. Later chapters, such as "Isis", "Adonis", and "The Myth of Balder" explicate individual myths, which the author usually stretches to fit his all-encompassing theory that religion is all and only about the worship and occasional sacrifice of a sun king and an earth queen. Controversially including the Crucifixion as an example of fertility rites and resurrection myths, this is, for ten points, what sociological work of James Frazier.

Answer: The Golden Bough

19. His birth saved his family from creditors, due to an ancient law protecting pregnant women's property from seizure. He painted two dozen nudes between 1916 and 1919, including *Reclining Nude from the Back*, and he also painted *Girl with a Polka-Dot Blouse* in 1919. He had a notorious love affair with Anna Akhmatova in 1910, but progressed on to two of his better known muses, Beatrice Hastings and Jeanne Hebuterne, all of whom he painted. Known for his African-influenced sculptures of heads and paintings like *Madame Pompadour* with elongated features, for ten points, who was this modernist Italian artist famous for his wild lifestyle?

Answer: Amedeo Modigliani

20. He famously hosted Alexander Solzhenitsyn at his house after the latter was exiled from the Soviet Union in 1974. Inspired by the media frenzy over the Red Army Faction terrorists led by the Axel Springer newspapers, especially *Bild-Zeitung*, he wrote *The Lost Honor of Katharine Blum* about a harassed woman who shoots a reporter. He is probably more famous for the story of Cologne's Faehmel family and how World War II affected them. For ten points, name this 1972 German Nobel Literature laureate and author of the aforementioned *Billiards at Half-Past-Nine*, as well as the short story *The*

Clown.

***Answer:* Heinrich Böhl**

21. Robert Bork, in his book *Slouching Towards Gomorrah*, as well as Daniel Patrick Moynihan in a famous essay, cite his sociological concept of defining deviancy downwards, with regard to a society being able to recognize only a constant number of offenders, and apply it to contemporary American society. Originally inspired by Herbert Spencer and his theories of civilizational evolution, he reconceptualized it in terms of the division of labor, and sought to explore the nature of punishments. In his better known work on suicide, he contrasted differing extents of social integration and popularized the concept of anomie. For ten points, name this early 20th century French sociologist.

***Answer:* Emil Durkheim**

22. Fu Sheng saved the Shang shu from it by delivering the Jinwen to Chao Cuo, although Kong Anguo also provided the guwen, and Zhang Jie said that it caused Xiang Yu and Liu Bang to be uneducated. It was started to silence “those who use the past to denigrate the present” and targeted the “speeches of the hundred lineages.” Urged on by Li Si, it was a part of Emperor Shi Huang’s campaign against everything that was not practical or legalistic. For ten points, name this conflagration of confucian texts during the Qin dynasty:

***Answer:* Fenshu kengru or book burning (and burying the scholars)**

2 Caltech Bonuses, Round 12

1. Mexico likes revolutions. Who knows, they may even be on the verge of another one soon. To refresh our memories, let's take a trip down memory lane. For ten points each :

10 The Mexican war which occurred immediately before the imposition of Emperor Maximilian is known by this name in light of the struggle between liberal and conservative factions.

Answer: War of Reform or La Reforma

10 The liberals were led by this man of full-blooded Zapotec ancestry, who famously grew up illiterate in Spanish.

Answer: Benito Juarez

10 Juarez was a native of this southern Mexican city which is the capital of its namesake state.

Answer: Oaxaca [wah-HAH-kah]

2. Given a reaction, identify the biological enzyme or class of enzymes that catalyzes it, for ten points each:

10 Breakdown of hydrogen peroxide into water and oxygen.

Answer: catalase

10 A class of motor proteins that separate the two double-helical strands of DNA, allowing such processes as DNA replication and RNA synthesis to occur.

Answer: helicases

10 A class of enzymes that transfers phosphate groups from high-energy donor molecules, usually ATP, to target molecules.

Answer: Kinases, do not accept phosphatases or phosphorylases

3. Jewish religious bodies have never been the same since AD 358. FTPE, let's find out why.

10 In AD 358, this body of 71 judges took its last recognized decision, regarding putting the Jewish calendar on a firm footing in the absence of its ability to meet regularly.

Answer: Sanhedrin

10 This famous twelfth-century Spanish-Jewish scholar and author to *Guide of the Perplexed* put forth a proposal to revive the Sanhedrin.

Answer: Maimonides

10 The recently reconstituted version of the Sanhedrin is seen by most Israelis as a political ploy towards reconstruction of this building destroyed in 70 CE by the Romans

Answer: Temple Mount or Har haBayit or Sacred Sanctuary
or al-haram as-Sarif

4. The earth's crust has many different names for its myriad regions. Explore a few of them for ten points each.

10 Tectonic plates are pieces of this region, which refers to both the crust and the uppermost layers of the mantle.

Answer: lithosphere

10 Tectonic plates float on this "weak" layer of the mantle beneath the lithosphere.

Answer: asthenosphere

10 Plate drift over time can be measured against these reference points, which appear to remain stationary over geologic time.

Answer: mantle plumes or volcanic hotspots

5. Answer the following questions about a piece of mid-twentieth century American literature.

10 A Florida family on a car trip to Georgia is slaughtered by a serial killer named the Misfit in this 1955 short story.

Answer: A Good Man Is Hard to Find

10 This author of a Good Man is Hard to Find died at the young age of 39 and is known for being one of the few notable Southern Catholic writers.

Answer: Flannery O'Connor

10 This character in the story is the last to die at the Misfit's hands, after exclaiming that he is her metaphorical child.

Answer: The grandmother (accept equivalents)

6. J.M.W Turner seems to have done a lot of paintings. Name some of them, for ten points each.

10 There's a train in the foreground, advancing across a bridge and the skies appear to be filled with clouds.

Answer: Rain Steam and Speed: The Great Western Railway

10 The ship astern to *Victory* at Trafalgar, the subject to this painting served as a prison ship for some years before being dragged to London to be broken up in 1838. The setting sun is particularly notable in the right background.

Answer: The Fighting Temeraire

10 This painting depicts the inmates of the title object being thrown overboard still shackled as their owners prepare for a typhoon.

Answer: The Slave Ship

7. Answer the following questions about one of the greatest works of Persian literature for ten points each.

10 This epic poem forms the basis for the Persian language and was written around 1000 AD.

Answer: Shahnama or Book of Kings

10 Famously rejected by Mahmoud Ghaznavi when he presented him with the Shahnama was this author of the Shahnama from Tus, whose name means heavenly in Persian.

Answer: Firdowsi

10 Key in the plot is this legendary fourth king of the world who possessed a magical seven-ringed cup after which Iranian state television names its international satellite channel.

Answer: Jamshed (the cup and channel are called Jam-e Jam)

8. Hungary seems not to get its due in classical music. Stuff about a certain Hungarian composer, for ten points each.

10 This opera about a mythical figure who murders his wives actually leaves them all alive, but imprisoned in the end.

Answer: Duke Bluebeard's Castle or A kkszakll herceg vra

10 This Hungarian composer wrote *Duke Bluebeard's Castle*, as well as such works as the tone poem *Kossuth*.

Answer: Bela Bartok

10 In this Bartok work, the title figure, who lusts after a prostitute, cannot be killed by a band of hoodlums until he has his way with her.

Answer: The Miraculous Mandarin or Der Wunderbare Mandarin

9. A mini-course in Ethiopian history, for ten points each.

10 Ethiopia's leader at the battle of Adowa, he staved off Italian occupation of his country until the 1930s.

Answer: Menelik II

10 Menelik married this immensely influential noblewoman, who led the conservative faction at court and often took the fall for difficult decisions, and after whom half of all Ethiopian restaurants in America appear to be named

Answer: Empress Taytu Betul

10 Menelik claimed descent from this biblical figure who supposedly cavorted with Solomon.

Answer: Queen of Sheba

10. The British entered into many diplomatic agreements concerning the Middle East during World War I. True to the motto *Perfide Albion*, they broke most of them. For ten points each, name some.

10 Named for a British Prime Minister, this 1917 declaration expressed the favorable disposition of the British Government towards the establishment of a Jewish National Home in Palestine.

Answer: Balfour Declaration

10 A notorious believer in Jewish conspiracy theories and a French Foreign Ministry official lend their name to this 1916 diplomatic agreement dividing the idle East into French and British spheres of influence which Lloyd George subsequently violated.

Answer: Sykes-Picot Agreement

10 Contradicted by both of the above was this correspondence between Britain's chief ally in the Hejaz and the British high commissioner in Egypt, which promised Arab independence for all districts not west of a Damascus-Aleppo line, not clarifying whether Jerusalem was indicated. Oops.

Answer: Hussein-McMahon Letters

11. Name the following F-theorems in mathematics, For ten points each :

10 When applied to linear algebra, this theorem states that a linear automorphism either is surjective or has non-zero kernel.

Answer: Fredholm alternative

10 This theorem of analysis states that if a function is absolutely integrable over a product measure, then its iterated integral over the marginal measures, performed in any order, would be the same.

Answer: Fubini's theorem

10 For a sequence of non-negative measurable functions, this lemma states that the integral of the limit inferior would be less than or equal to the limit inferior of the integrals.

Answer: Fatou's lemma

12. The people that once bestowed commands, consulships, legions, and all else, now meddles no more and longs eagerly for just two things. For ten points each ...

10 What are these two things, according to Juvenal?

Answer: Bread and Circuses or panem et circenses

10 "No mortal skin and bone can live on bread and circuses alone," according to this band who also wrote "Whats the Matter Here?," "Trouble Me," and "Eat for Two" before Natalie Merchant left in 1993.

Answer: 10000 Maniacs

10 On this television show, the episode Bread and Circuses concerns the crew of the Beagle, who are enlisted to help entertain the angry Roman populace who are distracted by the "Sun/Son worshipers."

Answer: Star Trek: The Original Series

13. Identify the following glands, for ten points each:

- 10 The main producer of enzymes for the digestion of lipids and proteins, it is also responsible for producing glucagon.
Answer: pancreas
- 10 A small endocrine gland located in the brain, it contains cells similar to the photoreceptors in the eyes, and in birds and amphibians regulates the circadian clock. It is also responsible for the production of melatonin.
Answer: pineal gland
- 10 3. A pair of glands located slightly below and to the side of the vagina in women, they secrete mucus to provide lubrication, facilitating sexual activity. They are homologous to Cowper's glands in males.
Answer: Bartholin's glands or Greater Vestibular glands
14. Europe went through a notable phase in the late nineteenth century of fascination with Japanese art. Some facts about one of the primary foci of this craze, for ten points each.
- 10 Part of a series entitled Thirty-Six views of Mount Fuji, the mountain itself is somewhat dwarfed by the title blue monstrosity undoubtedly taking out some surfers in this woodcut.
Answer: The Great Wave off Kanagawa or Fugaku sanjurokkei: Kanagawaoki namiura (accept variants)
- 10 This artist of the Thirty-Six Views of Mount Fuji was considered a primary light of the ukiyo-e movement.
Answer: Katsushika Hokusai
- 10 Hokusai is also known for having carved possibly the first prominent example of tentacle porn; this 1820 woodcut depicts a woman being pleased in an unusual way by some eight-appendaged creatures.
Answer: Dream of the Fisherman's Wife or anything in Japanese with yu shi and meng in it
15. Name these John Donne poems from lines for ten points each.
- 10 "No where / Lives a woman true and fair. . . . Though she were true, when you met her, / And last, till you write your letter, / Yet she Will be False, / ere I come, to two, or three."
Answer: Go and Catch a Falling Star
- 10 "A breach, but an expansion/Like gold to aery thinness beat/If they be two, they are two so/As stiff twin compasses are two"
Answer: A Valediction Forbidding Mourning
- 10 "[W]e're met/And cloister'd in these living walls of jet/Though use make you apt to kill me/Let not to that self-murder added be/And sacrilege, three sins in killing three."
Answer: The Flea

16. The time period leading up to the Second Sino-Japanese War was marked by “incidents.” For the stated number of points, answer the following questions about some of them.
- 10 This incident of September 1931 resulted when an explosion occurred near the South Manchurian railway. The Japanese invaded and occupied Manchuria as a result.
Answer: Mukden or Shenyang Incident or September 18 Incident
- 10 The Chinese general in charge of Chinese forces in Manchuria, Zhang₁ Xue₂liang₂, was perhaps ordered to stand down by this husband of Song₄ Mei₃ling₂.
Answer: Jiang₁ Jie₄shi₂ or Chiang Kai-shek
- 10 This incident near Bei₃jing₁'s Feng₁tai₂ suburb was the start of the Second Sino-Japanese War.
Answer: Lugouqiao Incident or Marco Polo Bridge Incident
17. The logic of computability made startling advances in the 1930s, foremost which included the devising of a better-known equivalent to Church's lambda calculus.
- 10 What theoretical constructs consisting of infinite tape and a read head are known by the name of their inventor, a British mathematician?
Answer: Turing machines
- 10 This theorem states that all trivially specifiable properties that would differentiate the languages that Turing machines recognize are themselves undecidable.
Answer: Rice's theorem
- 10 Turing used this construct to give a negative answer to this problem as Church had in 1936, concerning whether a function can decide whether another ceases computing.
Answer: Halting problem or Entscheidungsproblem
18. He invented the practice of representing a sentence as a tree, an element of his Voelkerpsychologie, and suggested that the sentence was the basic structure of language. For ten points each ...
- 10 Name this German psychologist and author of *Principles of Physiological Psychology*.
Answer: Wilhelm Maximilian Wundt
- 10 Wundt helped originate the idea that this aspect of cognition was limited into discrete chunks, later expanded in George Miller's *Magic Number 7* paper.
Answer: short-term memory
- 10 Wundt's investigations of memory were further expanded by this psychologist who created lists of nonsense syllables examined in his *On Memory*.
Answer: Hermann Ebbinghaus
19. For ten points each, or five if you need the team, identify the first player chosen in the NHL entry draft for each given year.
- 10 1984

5 Pittsburgh Penguins
Answer: Mario Lemieux

10 2004

5 Washington Capitals
Answer: Alexander Ovechkin

10 2000

5 New York Islanders
Answer: Rick DiPietro

20. For ten points each, identify the country that is bordered by each of these countries:

10 Thailand, Laos
Answer: Cambodia

10 Georgia, Armenia, Iran
Answer: Azerbaijan

10 Angola, Botswana, Mozambique
Answer: Zambia