Chicago Open 2021 Tiebreakers

**NOTE:** Only open this packet AFTER INFORMING THE TOURNAMENT DIRECTOR. Inform them which tossup you intend to use. If a replacement tossup is needed, select a replacement from within the same broad category if possible.

**A poem by this author likens authors who cannot see that “stones are in agony” to wreaths which are blind to rain falling on “motionless / rotten flowers on the tomb.” That poem by this author attacks poets who love Gide (“zheed”) and Rilke as “pale grubs in the capitalist cheese” and “false existentialist sorcerers.” This author says that his Parisian poet-friends Aragon, Eluard, and Ehrenburg are with him in a poem cursing a “traitor” who instead works with the detective Peluchonneau. He opened another collection with a poem declaring “I laugh / I smile / at the (\*)** old poets,” titled “The Invisible Man.” This author included poems rebuking “Celestial Poets,” “Oligarchies,” and the United Fruit Company in a sequence from his magnum opus named for the grainy material from which humanity was made. For 10 points, name this poet who included sections titled “The Fugitive” and “The Sand Betrayed” in his *Canto General* (“heh-neh-RAHL”).

ANSWER: Pablo **Neruda** [or Neftali **Reyes**]

<Poetry, Will Alston>

**A South African historian with this surname argued that 1930s Caribbean riots had resulted from bureaucratic neglect in *Warning from the West Indies*. A 7-foot tall U.S.-born millionaire with this surname invited Theodore Roosevelt to visit his Juja Farm in Kenya for big game hunting expeditions. A [emphasize] *response* to a politician with this surname claims “justice to all” requires justice for those with “such a stake here that…we have nowhere else to go” and was authored by Hendrik Verwoerd (“FAIR-vurt”). That politician with this surname said “I am here to learn” to Kwame Nkrumah during a (\*)** visit to Accra that kicked off a month-long colonial tour in 1960. A prime minister with this surname declared “Whether we like it or not, this growth of national consciousness is a political fact” in a speech to the South African parliament about “winds of change.” For 10 points, give this surname of the British prime minister who succeeded Anthony Eden.

ANSWER: **McMillan** [or **Macmillan**; accept William Miller **Macmillan** or William Northrop **McMillan** or Harold **Macmillan**]

<CW / International History, Will Alston>

**A fresco cycle in one of this city’s chapels features an early use of *trompe l’oeil* (“tromp loy”) by depicting its namesake saint resurrecting the son of Nerva and healing the daughter of a man named Arnulfus. A building in this city contains an unusual fresco depicting a group of soldiers bathing in a *pescarium* that is surrounded by a yellow wall; that painting is found in a magnificent room whose name indicates that a life-sized statue of a stag was once in it. This city’s Chapel of Saint Martial was decorated by Matteo Giovannetti (“joh-vah-NET-tee”). After collaborating with his brother-in-law (\*)** Lippo Memmi, a Sienese artist ventured to this city, decorated its largest building, and made a portrait of Laura de Noves. The *trecento* (“treh-CHEN-toh”) artist Simone Martini spent much of his life in this non-Italian city and worked extensively on its *Palais des Papes* (“puh-LAY de pep”). For 10 points, what southeastern French city was once the seat of the papacy?

ANSWER: **Avignon**

<Painting/Sculpture, Ike Jose>

**These structures are statically unstable if *m* plus the number of redundants is less than 2*j*. In a method of analyzing these structures, they are cut with an imaginary section to form two free body diagrams, and then the desired forces are obtained from the equilibrium equations. Although various FEA tools are used now, it used to be standard practice to analyze these structures graphically using a method named for Cremona and/or Maxwell. The method of sections and the method of (\*)** joints are used to analyze these structures. In these structures, members are assumed to carry only axial force and all loads are applied only at the joints. The Warren type of these structures is simple and reliable, and their king post type is often used in roofs. Arrays of triangular units make up, for 10 points, what load-bearing structures commonly used in bridges?

ANSWER: **truss**es

<Physics, Jonathen Settle>

***NOTE: Do NOT read to Lafer et al.***

**In 1998, a spacecraft observing this object was lost in space after the ground team mistakenly shut down Gyro B as part of a series of errors that triggered three successive Emergency [this object] Reacquisition modes; the recovery of that spacecraft was dubbed “The Million-Mile Rescue.” Terry Lovejoy names an object whose Kreutz path orbit takes it extremely close to this object. Observations of the MSW-LMA mechanism by the Borexino collaboration are answering long-standing questions about the composition of this object. A probe observing this object carries a memory card containing 1.1 million names and a 1958 paper by (\*)** Eugene Parker. The first detection of *g* modes deep within this object were made using data from a spacecraft in orbit around L1. Many comets named for “grazing” this object have been discovered by SOHO, which observes it. For 10 points, the Homestake experiment detected neutrinos emitted by what Solar System object?

ANSWER: the **Sun** [accept **sun**grazers]

<Other Science: Astronomy, Zach Foster (Lafer et al.)/Jonathen Settle>

***NOTE: Do NOT read to WUSTL++***

**The solid-state form of these devices use an optocoupler to perform their role without moving parts.Blowout magnets allow these devices to be made in smaller sizes because they extend these devices’ arc distance. Contactors serve a similar purpose to these devices but are equipped with arc suppression and overloads because they carry higher loads. When a person tries to start a car, and the starter makes a lot of clicking sounds, one of these devices is malfunctioning. The simplest form of these devices contain a wire coil wrapped around a solenoid, which when energized causes a movable armature to (\*)** close a circuit. The use of Boolean algebra to simplify the arrangement of these devices in circuits was the subject of Claude Shannon’s master’s thesis. These devices were first used as signal repeaters in telegraphs. For 10 points, name these switches operated by an electrical current.

ANSWER: **relay**s [accept **contactor**s before mentioned; prompt on starter solenoids; prompt on any type of switch]

<Other Science: Applied/Data Science/Engineering, Charles Hang>

Though both of these artists created paintings of the head of Medusa, one showed her head upright at the center of a *tondo*, while the other showed it on the ground with the snakes slithering away. For 10 points each:

[10m] Name these two artists. One of them made a copy of the other’s *Entombment of Christ*, as well as many other paintings, while residing at the court of Vincenzo I, and later painted *The Consequences of War*.

ANSWER: Pieter Paul **Rubens** AND Michelangelo Merisi da **Caravaggio**

[10h] A letter by Rubens to Duke Vincenzo remarks that Caravaggio’s two “most beautiful paintings” are *Judith Killing Holofernes* and this other one, which Rubens and the Breughel family acquired in 1618. A red draping adorns the top of this Caravaggio altarpiece, in which Mary gestures towards Saint Dominic at the left.

ANSWER: ***Madonna of the Rosary*** [or ***Madonna del Rosario***]

[10e] Caravaggio’s influence shows in Rubens’ painting of this scene for the Confraternity of Arquebusiers. Rogier van der Weyden’s version of this scene, which shows Mary fainting, was painted for a guild of crossbowmen.

ANSWER: ***Descent*** *from the Cross* [or ***Deposition*** *from the Cross*]

<Painting/Sculpture, Will Alston>

The notion that an “Arab” example of these events took place from 700 to 1100 C.E. was advocated by the historian Andrew Watson, citing the importation of sorghum and fruits from China. For 10 points each:

[10e] Give this two-word name which also identifies a period in Britain from the mid 17th through 19th centuries, during which land output greatly increased due to enclosure and better use of crop rotation methods.

ANSWER: **Agricultural Revolution** [accept Arab **Agricultural Revolution** or Second **Agricultural Revolution**]

[10m] Two Arab groups of this name title Ibn Wahshiyya’s 10th century book of agriculture, magic, and astrology, which he claimed to have translated from a 20,000 year old Syriac text. One of those groups of this name lived in Iraq, while the other made its capital in a city accessed through a narrow passage called the Siq.

ANSWER: **Nabataean**s [or **Nabatu** or al-**Anbat**] (The capital is Petra.)

[10h] Production throughout the Islamic world was enhanced by these water-lifting wheels, invented by the Ptolemies and Nubians, which improved on the earlier *shaduf* by using the labor of oxen instead of humans.

ANSWER: **saqiyah** [or **sakia**s, or **tablia**, or **Persian** wheels; prompt on flywheel or tympanum]

<World History, Will Alston>

During his career, this poet shifted from writing anti-clerical cantos such as *The Triumph of Liberty* to writing odes celebrating Catholic sacraments, such his *Sacred Hymns*. For 10 points each:

[10m] Name this author. In his best-known novel, a criminal called “The Unnamed” releases a woman from a castle and miraculously converts to Catholicism upon meeting Cardinal Borromeo.

ANSWER: Alessandro **Manzoni** (The novel is *The Betrothed*.)

[10h] Perhaps the greatest reflection of Manzoni’s turn against Enlightenment ideals is this poem, written upon the death of Napoleon Bonaparte, which states “never bent / Beneath death’s hand a haughtier soul.”

ANSWER: “The **Fifth of May**” [or “Il **cinque maggio**”]

[10e] Manzoni’s turn towards liberal Catholicism, and away from Enlightenment idealism, is often contrasted with this Italian Romantic author of the same era, who wrote numerous *Canti* and the sonnet “The Infinite.”

ANSWER: Giaocomo **Leopardi**

<Poetry, Will Alston>

A group of monks from the Fuke sect of Zen Buddhism called *komusō* walk around with baskets covering their entire heads while playing these instruments during public festivals. For 10 points each:

[10m] Name this instrument which is featured along with a *biwa* and western orchestra in Toru Takemitsu’s piece *November Steps*. This traditional Japanese flute is usually made of bamboo.

ANSWER: **shakuhachi**

[10e] This film composer featured the shakuhachi heavily in his score for *Memoirs of a Geisha*. You may know him better for composing Darth Vader’s theme song.

ANSWER: John **William**s

[10h] Toru Takemitsu’s score to this film includes the track “Flute of Darkness,” in which a shakuhachi plays piercing high notes as several buildings burn in the background, as well as the track “Hell’s Picture Scroll.”

ANSWER: ***Ran*** (by Akira Kurosawa)

<OArts: Music, Will Alston>

This symbol represents a product developed by Moyal used in the phase space formulation of quantum mechanics. For 10 points each:

[10e] Name this symbol, which also represents an operator on exterior algebras named for Hodge. The complex conjugate of a complex number is either denoted with a horizontal bar over z or by this symbol.

ANSWER: **star** [or **asterisk**]

[10m] Moyal star-product operator algebras can be constructed from any of the manifolds with structures named for this mathematician. In addition to satisfying the Jacobi identity and Leibniz’s rule, a binary map named for this mathematician is invariant under canonical transformations in Hamiltonian mechanics.

ANSWER: Simeon **Poisson**

[10h] That construction can formally be done using the 'quantization formula' named for this Russian-French Fields medallist. Ed Witten’s conjecture about two models of quantum gravity sharing a partition function was proven by this mathematician in his 1992 PhD thesis.

ANSWER: Maxim **Kontsevich**

<Other Science: Maths, Joseph Krol>

For 10 points each, answer the following about using secure function evaluation, or SFE, to perform secure two-party computation:

[10h] A classic illustration of SFE is this problem introduced by A.C. Yao. In this problem, two people use a third party to determine who is wealthier without revealing their net worth to each other.

ANSWER: **Millionaires**’ problem

[10e] A practical implementation of SFE is fundamental to making this type of computing secure. In this type of computing, users run their programs on remote servers rather than local machines.

ANSWER: **cloud** computing

[10m] One of the first attempts at practical SFE was the Fairplay compiler, which implemented Yao’s original protocol that exchanges inputs to garbled Boolean circuits using oblivious transfer. Simple oblivious transfer protocols can be built from this key exchange protocol that allows two parties to establish a shared secret over an insecure channel.

ANSWER: **Diffie–Hellman** key exchange protocol

<Other Science: Computer Science, Jonathen Settle>

This technique was pioneered by Rick Trebino’s research group at Georgia Tech. For 10 points each:

[10h] Name this technique of completely characterizing ultrashort laser pulses. This technique measures an auto-spectrogram by having the pulse gate itself in a nonlinear optical medium.

ANSWER: **FROG** [or **frequency-resolved optical gating**]

[10e] FROG is equivalent to an autocorrelator except a spectrograph takes the place of a detector that uses this effect to create electrical current. In this effect, photons eject electrons from the surface of a material.

ANSWER: **photoelectric** effect

[10m] A popular FROG variant relies on this effect driven by a second-order nonlinearity in the susceptibility. This effect sees photons are coherently combined to form new photons with twice the energy.

ANSWER: **second-harmonic generation** [or **SHG**; prompt on sum-frequency generation; prompt on harmonic generation]

<Physics, Jonathen Settle>