
WATCH
THE
SKIES

LIGHT FROM UNCOMMON STARS

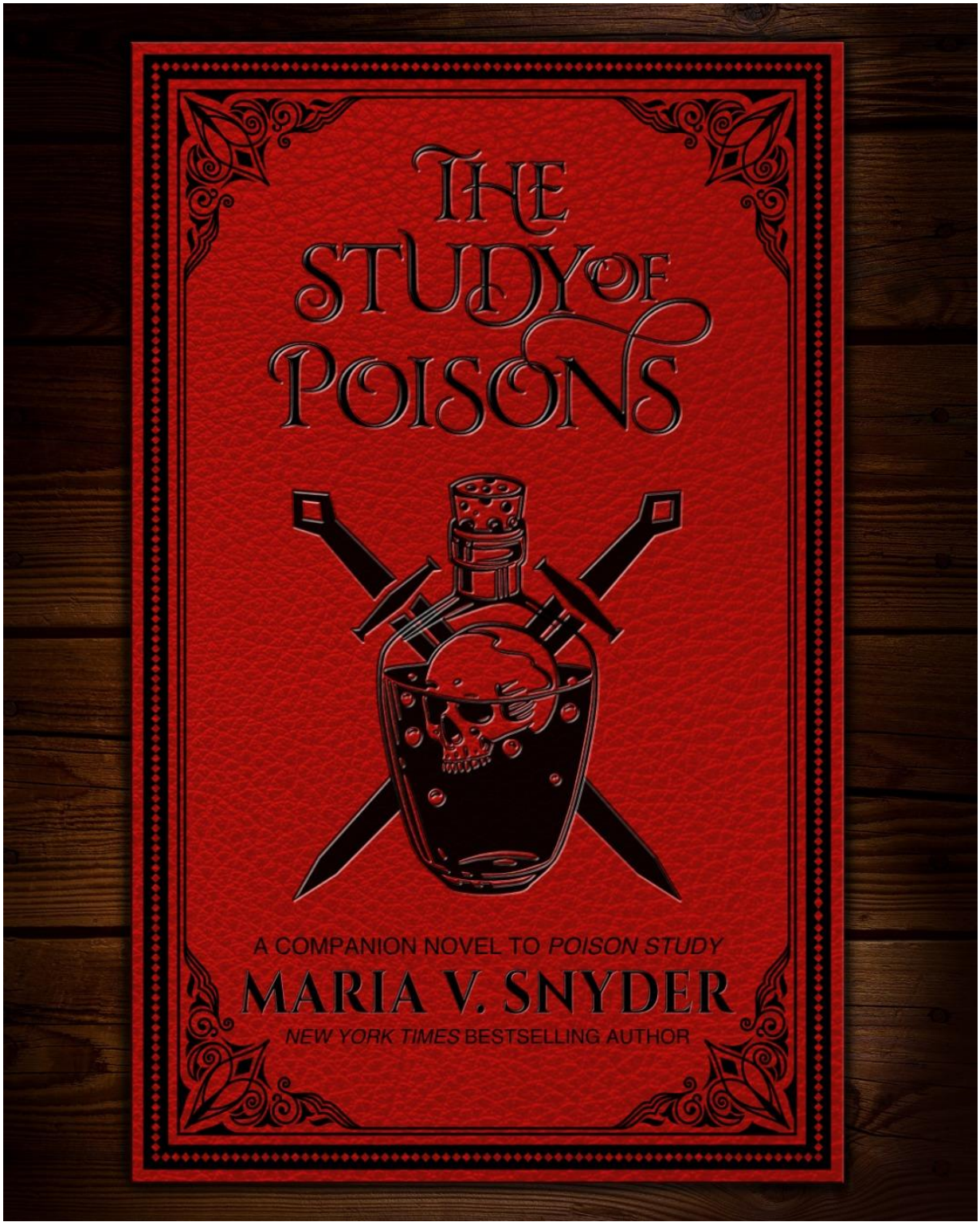
By Ryka Aoki

23.4

Katrina is on a journey to escape the identity she used to have. She'll take everything she cares about and escape, including her violin, one of the few things that brings her peace. The last thing she'd ever expect is to catch the notice of Shizuka, a mentor of talented violin players. Searching for years for the next prodigy, Shizuka definitely wants to become her mentor. The last thing Shizuka would ever expect is to randomly encounter someone at the Starrgate Donut shop who would make such a lasting impression as Lan. All three are on a collision course that will reset their destinies, but each is carrying a secret: one has made a deal with the devil, one is transgender, and another is a starship captain hiding from an intergalactic war.

-May's meeting is on the 17th, in person, at the Simpson Library, Mechanicsburg (unless otherwise announced) and the book of the month is *Bluebird* by Ciel Pierlot.
-Cover art by Eric V. Hardenbrook

Check out the website at: watchtheskies.org or
contact us at: wtsnewsletter@gmail.com



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NEW RELEASES

May 2023

NINA ALLAN - **Conquest**

KAGE BAKER - **Maelstrom and Other Martian Tales**

PETER S. BEAGLE - **The Essential Peter S. Beagle - Volume 1 & Volume 2**

PIERCE BROWN - **Light Bringer**

MELVIN BURGESS - **Loki**

GENEVIEVE COGMAN - **Scarlet**

SEBASTIEN DE CASTELL - **The Malevolent Seven**

GREG EGAN - **Sleep and the Soul**

NICK HARKAWAY - **Titanium Noir**

JOANNE HARRIS - **Broken Light**

CASSANDRA KHAW - **The Salt Grows Heavy**

R.F. KUANG - **Yellowface**

MARK LAWRENCE - **The Book that Wouldn't Burn**

C.E. MCGILL - **Our Hideous Progeny**

PREMEE MOHAMED - **No One Will Come Back for Us**

JODY LYNN NYE & DEAN WESLEY SMITH, EDS. - **L. Ron Hubbard Presents Writers of the Future Volume 39**

TEMI OH - **More Perfect**

DANIEL JOSÉ OLDER - **Last Canto of the Dead**

CHRISTOPHER PAOLINI - **Fractal Noise**

SARAH PINSKER - **Lost Places**

RORY POWER - **In an Orchard Grown from Ash**

CHRISTOPHER PRIEST - **Airside**

TOM REAMY - **Under the Hollywood Sign: The Collected Stories of Tom Reamy**

CHARLES STROSS - **Season of Skulls**

MICHAEL SWANWICK - **The Best of Michael Swanwick - Volume Two**

ADRIAN TCHAIKOVSKY - **Lords of Uncreation**

MARTHA WELLS - **Witch King**

NEWS OF THE REALM

Book Signing Maria V. Snyder, May 6th, 1PM at Barnes and Noble, Lancaster. Maria will be signing her latest work The Study of Poisons as well as other favorites.

Balticon 57, May 26-29th, the Renaissance Hotel, Baltimore Inner Harbor, MD. For more information: Home | Balticon 57

Shore Leave 43, July 7-9, the Delta Hotel, Hunt Valley, MD. Media Guests include: Ben Browder, Claudia Black, Grace Park, Aaron Douglas, Robert Picardo, Peter Macon, Jennifer Johnson Jerald, Bonnie Gordon, Robert Duncan McNeill, and Alaina Huffman. For more information: Shore Leave: A Fan-Run Science Fiction Convention (shore-leave.com)

Confluence – Pittsburg's Literary Science Fiction and Fantasy convention is July 21st-23rd at the Sheraton Hotel Pittsburgh Airport Hotel in Coraopolis, PA. Guest of Honor will be Ada Palmer, winner of the John W. Campbell Award and the Compton Crook Award in 2017. Featured musical guest Sassafrass is an a cappella troop lead by Ada Palmer.
For more information: https://confluence-sff.org

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SCIENCY STUFF

Fusion is a process and so, apparently, is its development. The idea of a breakthrough in fusion energy tends to be more of a step toward the result that scientists are seeking to create. We've had a shining example of the process overhead since humanity looked up for the first time. Much like having the Moon overhead as a destination spurred our interest in space travel, our ability to study the Sun and understand the processes that occur within it, allowed us to work towards the development of fusion energy. A sustained reaction was the first of these steps and that was accomplished at Lawrence Livermore National Laboratory's National Ignition Facility on August 8th in 2021. By December, the Joint European Torus was able to sustain a reaction for 5 seconds. This past week, on Wednesday the 12th, the Experimental Advanced Superconducting Tokamak, in China, was able to sustain plasma for 403 seconds. Scientists have two benchmarks for success. A reaction lasting more than 300 seconds is deemed to have crossed the threshold of sustainability. The second mark is that a sustainable process operating for 30 minutes is a good representation of the true value that fusion can accomplish. The EAST project in China also was able use a high confinement mode which allowed a significant increase in temperature and plasma density. China has already begun the next step by designing EAST's replacement known as CFETR which they hope to have completed by 2035. This milestone is not the only news currently, interestingly enough, MIT also has 2035 marked as a date for the launch of its Sparc reactor. They believe that their more compact fusion device could produce as much as twice the amount of energy it consumes. While still in development with partner Commonwealth Fusion System, MIT hopes to begin construction as early as the Summer of 2024 with the project taking 3-4 years to finish. Sparc is designed to take advantage of upgraded electromagnetic technology to create a higher magnetic containment field to allow the compression of plasma increasing the amount that it can contain as well as the temperature. Most scientists are focused on using forms of hydrogen as the fuel for their reactors. While typical fusion requires much smaller amounts to create a reaction than a fission reactor, the fuel is usually a combination of deuterium and tritium (regular hydrogen has one proton at its nucleus, deuterium has a proton and a neutron, while tritium has a proton and two neutrons). The key there is tritium which is rare enough and needs to be bred in a process that requires lithium (another item that is becoming harder to acquire). So, there is a legitimate concern about the amount of potential fusion fuel. Also, fusion reactions produce high- energy neutrons which are detrimental to not only the structure of the reactor but those operating it. Researchers in Japan are questioning that logic and have come up with a different idea – use boron and protons. While this does stop the neutron production and this reaction's waste product is helium (yet another substance we are actually running low on), the flip side is the reaction needs to occur at temperatures that are 30 times higher than the typical fusion reaction. Researchers at the Large Helical Device in Japan were able to create a

boron plasma at a heat of 20 million Celsius, project hydrogen atoms at this, and then record the creation of helium atoms, thus proving the feasibility of the concept. Getting to the next step of sustainability will be a much more difficult proposition. So far researchers have been able to reach temperatures of 60 million degrees and maintain it for half a minute. The next generation machine is expected to be able to achieve 100 million degrees, which is still far less than the 3 billion degrees necessary for the desired result. Researchers of all branches still maintain a hopeful attitude that efficient and safe production of electricity will be possible via fusion within the next decade, a very helpful fact considering the expected increase in energy necessary to combat climate change while at the same time reducing the influx of greenhouse gases.

Timeline of nuclear fusion - Wikipedia

You Should Be Watching

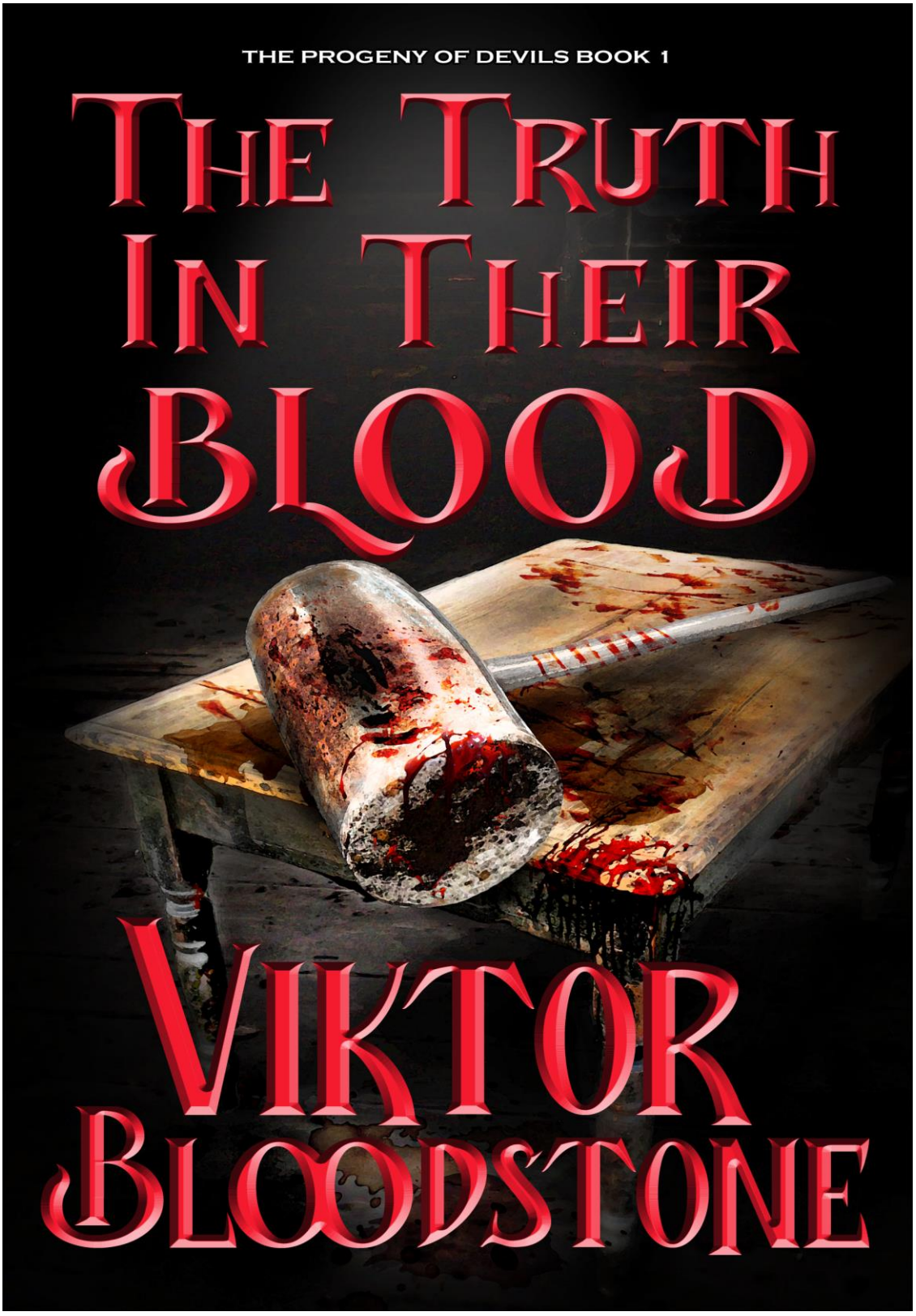
Jung_E

In another dystopian future entry, the Korean film Jung_e presents some very real questions about what developing A.I. means and presents a picture of how that can affect the people most closely related to any project connected to that development.

The earth has warmed, the waters have risen. Humans have moved off the earth to various space platforms. Three of these platforms band together and declare war on the other platforms. In an attempt to create a winning edge, the allied forces take an elite soldier and attempt to clone her brain. This cloning is intended to create a soldier with all the skills, subtlety, and loyalty of the original soldier in an easily replicated way. These clones will turn the tide and win the war for the allies. The experiments continue to run into an unknown obstacle, frustrating their attempts to complete this new A.I. soldier.

There are a number of pieces that are drawn into the film. I see a little bit of Robocop in there. I saw a little bit of Ex Machina. There's a touch of Ghost in The Shell. These are the things I see mixing and swirling around the story of the soldier and the doctor working on creating this new brand of soldier. It brings up a number of questions but doesn't necessarily answer them. This is a movie worth watching for the discussions it will give you after watching, along with a couple of very exciting action sequences. You should be watching Jung_E.

You should check out the trailer here: https://youtu.be/LCxnmfdxJ6s



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Tillyer's News of the High Frontier
APRIL 2023

A local scientist from Bucknell University and her team have found proof of exoplanets with magnetic fields. Just like gravity and the rotation of the Earth, humanity spends very little time concerned about our world's magnetic field. Without it, our world would bear similarities to Mars, a world whose atmosphere has mostly been stripped away by the energies emitted by the Sun. Jackie Villadsen and her team used observations from the Very Large Array in New Mexico to view a rocky exoplanet in orbit about YZ Ceti, a red dwarf located about 12 light years away. Even though the VLA is very sensitive, a magnetic field at that distance would be difficult to detect if we were looking at a situation similar to our own. YZ Ceti b however is in an orbit so close to its star that a year's orbit takes about two of our days. Even though the star is not as hot as ours, at this distance life as we know it is not possible. But, since the exoplanet is so close to YZ Ceti, the magnetic field of the planet interacts with the gases of the star's outer layer causing auroras which we can detect as radio waves via the VLA. Studies like this give us another tool in confirming the viability of exoplanets to potentially support life similar to ours by applying similar observations to newly discovered worlds. Sebastian Pineda of the University of Colorado at Boulder, a co-author of the study, is hopeful that continuing observation will not only verify the results but also give us more information about extra-solar space weather. We are already familiar with the effects of some of this weather in the form of auroras that light up the night skies in northern climes. Magnetic fields are also present on other planets in our solar system such as Jupiter. There, the massive field actually produces effects on the planet's many moons.

How did our magnetic field come into being? There are some scientists that believe that the rotation of the Earth and the continuing rotation of the liquids in the molten core were initiated by the impact of a protoplanet in the past. That very same impact is believed to have been the origin of the Moon. Other worlds may have acquired theirs due to the rotational energy from the collapse of their accretion disks as the planets formed. In both cases, the continuing rotation of either a liquid metal or metallic hydrogen core elements results in a magnetic field.


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