Type of Source	Author	Title	Date First Accessed	Link (if applicable)	Brief Summary of Information Provided	Rough Notes on Research	Review of Research Quality	Quality Score (1-5)
YouTube Video	Kurzgesagt - In A Nutshell	Neutron Stars - The Most Extreme Things	10/3/2022	https://www.youtube.com/watch?v=udFxKZRyQt4&t=448s	Along with first sparking my curiosity, this video gives a great but brief introduction into Neutron Stars, from their	Created when iron is produced at star core, which is nuclear ash and has no energy left to give (can't be fused). Gravity crushes into the iron core, making it denser and denser, and due to this pressure protons and electrons merge together, forming neutrons. Supernova implosion (traveling at 25% of c, bounces off iron core as an explosion. Neutron star's gravity is the greatest outside black holes, with temperatures over 1mil degrees. The	Kurzgesagt is one of the biggest science channels on the internet, priding themselves on having strict, peer-reviewed research that is written and checked by experts in the field of Neutron Stars & Astronomy.	5
YouTube Video	Kurzgesagt - In A Nutshell	The Most Dangerous Stuff in the Universe -	10/3/2022	https://www.youtube.com/watch?v=p_8yK2kmxoo&t=396s	This video, despite potentially not relating exactly to what I will be writing for my EPQ, provided lots of inspiration and sparked my curiosity to	Atoms desperately push against gravity, against the collapse of the star. If they win, a neutron star is formed. If gravity wins, a black hole is formed. Quark are confined, meaning you cannot separate them. If you use lots of energy to try, they just use this energy to make new quarks. As neutron stars are so dense, however, quarks deconfine into a bath of quarks. In the core, some quarks may convert into 'strange quarks', and may remain stable due to the intense pressure. This could be the 'ideal matter', causing it to convert other quarks into strange	Please see the above box (sources are from the same author).	5
Research Paper Extract	T. K. Jha	From Nuclear Matter to Neutron Stars	25/4/2022	https://arxiv.org/pdf/0902.0262.pdf	This source unfortunately didn't provide any substantial information, as the extract focussed more on the types of nuclear matter and EOSs, both of which I will not be mentioning in my project.	N/A	This source is from a Theoretical Physics Division from a research laboratory in India, and is written by a well-known scholar with 8 highly influential citations and 36 scientific research papers. They are also an Assistant Professor.	4
Book Extract	G.F Burgio, M Baldo, P.K Sahu, A.B Santra, H.-J Schulze	Physics Letters B - Maximum mass of neutron stars with a quark core	25/4/2022	https://www.sciencedirect.com/science/article/pii/S0370269301014794	This source was unfortunately too advanced for this project, as it discussed equations & theories that I will not mention in this project. It talked about quark stars and a Neutron Star's maximum mass before it collapses & dies.	Massive neutron stars are expected to possess a quark core.	Most of the authors of this source are either researchers in institute centres for nuclear physics, or in research centres in physics divisions. This source was written in collaboration with a lot of professional physicists with lots of research papers published.	4
Review Letter	M. E. Caplan, A. S. Schneider, and C. J. Horowitz	Elasticity of Nuclear Pasta	25/4/2022	https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.121.132701	Discusses the potential properties of nuclear pasta, stating that it may be the strongest known material in the universe.	Our results show that nuclear pasta may be the strongest known material, perhaps with a shear modulus of 1030 ergs/cm3 and a breaking strain greater than 0.1.	Like the previous source, this letter was written by multiple physicists & scholars working in institutes for Theoretical Physics & Astrophysics, one of which being an assistant professor.	4
Magazine Entry	Caroline Adams	What if a tablespoonful of neutron star was brought to Earth?	25/4/2022	https://astronomy.com/magazine/ask-astro/2018/08/neutron-star-brought-to-earth	This source provided a lot of information about the effects of neutron degeneracy pressure and its effects outside a system such as a Neutron Star, as well as revealing how powerful this pressure actually is.	Its protons and electrons have fused together to create neutrons under the pressure of the collapse. The only thing keeping the neutrons from collapsing further is "neutron degeneracy pressure," which prevents two neutrons from being in the same place at the same time. Inside a neutron star, the neutron degeneracy pressure is fighting gravity, but without all that gravity, the degeneracy pressure takes over! what's inside expands very rapidly. A spoonful of neutron star suddenly appearing on Earth's surface would cause a giant explosion, and it would probably vaporize a good chunk of our planet with it.	Though only from a magazine entry, astronomy.com has renowned for having excellent quality, as it is one of the top astrophysics magazines in America. The sources have also been quality assured by a PhD astronomer.	3
NASA Feature	Janet Anderson & Megan Watzke	NASA's Chandra finds Superfluid in Neutron Star' Core	25/4/2022	https://www.nasa.gov/mission_pages/chandra/news/casa2011.html	This source, whilst not strictly talking about the forces in a neutron star, was very useful in its description of Neutron Stars being a 'type' of superconductor, and how this may lead to the magnetic pulses they emit when they begin to collapse. Though I may not include this in my project, this source provided some very useful information.	Superfluids containing charged particles are also superconductors, meaning they act as perfect electrical conductors and never lose energy. The new results strongly suggest that the remaining protons in the star's core are in a superfluid state and, because they carry a charge, also form a superconductor. The onset of superfluidity in materials on Earth occurs at extremely low temperatures near absolute zero, but in neutron stars, it can occur at temperatures near a billion degrees Celsius. (between one and 1.5bn degrees). Note: magnetism may also come from positive metal ions and electrons (which make up around 10% of all matter in a Neutron Star.	This source is taken from the official NASA website and is written by multiple NASA employees. The source is therefore from a very accurate website, and is also peer-reviewed.	5

Online Encyclopaedia	Britannica	Ferromagnetism	25/4/2022	https://www.britannica.com/science/ferromagnetism	Helped me understand more fully about magnetism in neutron stars, and determining whether that is the 'secret' force that binds neutrons in them together. As this source is from an Encyclopaedia, however, I will use my notes on this more as a pointer in the right direction, rather than a proper source for my report.	Ferromagnetism is a property in which uncharged material strongly attract each other. Iron (which is found inside neutron stars) can gain this attractive power. These materials are magnetised easily, but have their magnetisation approaching a finite limit when in a strong magnetic field. This is called saturation. **This ferromagnetic ability temporarily lost when heated to a certain temp, called the Curie Point** (so NOT in neutron star). Above this point, the magnetism of the material vanished (parts become no longer aligned) and becomes paramagnetic (remains weakly magnetic). This occurs because the thermal energy becomes sufficient to overcome the internal aligning force of the material. The Curie temperature for iron is 1043K. This is all caused by the alignment pattern of atoms, which act as their own electromagnets, and therefore have their own magnetic moment (due to the motion of electrons in their shells and their **spin**). This small magnetism in the atom parts align themselves and reinforce each other.	This source is from an online encyclopaedia, and can be freely edited by the 'Editors of Encyclopaedia Britannica'. Though Britannica is known to be accurate, and articles cannot be changed by the general public, it is unknown as to who is the true author of this source.	1
YouTube Video	Parth G	Pauli Exclusion Principle	3/5/2022	https://www.youtube.com/watch?v=INYZy6_HaQE	This video was my first introduction into the Pauli Exclusion Principle. With this, I should learn how Neutron Degeneracy Pressure works, along with how protons and electrons in the dying star collide to form neutrons. Though complicated, this video gave me an excellent introduction to these topics.	Fermions are indistinguishable, meaning 2 fermions of the same kind cannot be told apart from each other. A wave function tells us all the information about a particle. By squaring this we find the square modulus of the particle, which tells us how likely we are to find that particle in a given location. We can measure this, and therefore because fermions are indistinguishable, the wave function squared of a system with 2 fermions is the same no matter which order the fermions are. By taking the square root of both sides, we get psi = +- psi. +psi links to bosons, -psi links to fermions. Therefore the wave function becomes negative under particle exchange (antisymmetric wave function). As a result of this, if we have 2 electrons in a shell, their wave functions must oppose, meaning that when we observe them and force their wave function to collapse, they must be in different states, or quantum States. This is called Pauli Exclusion principle. More factors influence quantum states such as mass, energy level, spin ext.	The author of this source is a masters graduate in physics from the University of Cambridge in Physics. He runs a mathematical YouTube channel with almost 200,000 subscribers, and this channel is well-known in the community for it's accuracy in teaching. I have also spent time fact-checking the information provided from this source - thus ensuring that the source is reliable.	3
YouTube Video	Michel Van Biezen	What is Neutron Degeneracy?	3/5/2022	https://www.youtube.com/watch?v=G5EjC7x8Egs	My first look at Neutron Degeneracy Pressure, a topic which will form a large part of my final project. Due to my previous research in Pauli Exclusion, I was able to understand this video a lot easier, and because of that I	2 main repulsive forces halted the collapse of a star to create a neutron star - the SNF and the neutron degeneracy pressure. Can't have 2 neutrons occupying the same quantum state (similar to Pauli exclusion with electrons - no 2 electrons with the same quantum numbers can occupy the same space). Neutrons are made of quarks, which have a kind of 'dual force', as they repel and attract each other due to SNF. This dual force creates the stable size of the neutron. Neutron stars can be upheld via neutron degeneracy pressure with a mass up to 0.7Msun (of core, not star).	This source is from an online lecture in Astrophysics, and is written by a professor in Physics (who has a PhD) of over 25 years in the Loyola Marymount University. He is very well known for his large audience on YouTube and well-credited research.	4
YouTube Video	Michel Van Biezen	How does the SNF Halt Core Collapse?	3/5/2022	https://www.youtube.com/watch?v=ThEq6YiYuBQ	Follows up on my research about Neutron Degeneracy Pressure, giving me crucial details about what stops a Neutron Star from spontaneously collapsing into a black hole. Discussed details about the Strong Nuclear Force, and how much of an	As neutrons are neutral particles, they don't repel each other like protons do. Therefore the SNF can very easily and quickly push them together. Because they are able to get so much closer than what would happen with protons, they get close enough for the SNF to turn repulsive (0.5fm). Due to entropy and particles wanting to have as low potential energy as possible, nucleons are usually 0.8fm apart, as this is where the attractive forces from the SNF are the greatest. The initial bounce-back of a neutron star collapsing are formed by the SNF becoming so repulsive that it overcomes the collapse of the star. Past 3Msun it will become a black hole (too much pressure)	Please see the above box (sources are from the same author).	4
Online Forum	Danijel	What happens when a proton and electron collide?	3/5/2022	https://physics.stackexchange.com/questions/651283	First bit of research about how protons and electrons collide to form neutrons due to electron capture. Although I will most likely not use this research in my final project (as the source could be scrutinised for being from an online forum), it formed the basis for future research about this sub-topic.	If a proton and electron are 'slammed' into each other, they *might* form a neutron + an electron neutrino.	This source is from an online physics forum, in which anyone can respond to questions. The author of this quote is unknown, however their comment has received good feedback from the community. However, this source is of a low quality, and as a result I will not be referencing this in my report.	1
University Paper	Weicheng Lv	Deconfinement Phase Transition in QCD	17/5/2022	https://guava.physics.uiuc.edu/~nigel/courses/563/Essays_2008/PDF/lv.pdf	Provided information about how quarks could possibly deconfine in a neutron star's core.	At low energy, the interactions between quarks are so strong that they form a bound state because of colour confinement. However, at high energy, due to asymptotic freedom, the effective coupling becomes small. Quarks will be deconfined, leading to a state of quark-gluon plasma	Weicheng Lv, the author of this source, is a postdoctoral research associate with a PhD at the University of Tennessee. He has published over 10 high-quality research papers and has been cited over 800 separate times - furthermore, many of his papers have been published by the American Physical Society.	4

Trusted Physics Website	Howard S. Matis	Phases of Nuclear Matter	17/5/2022	https://www2.lbl.gov/abc/wallchart/chapters/09/0.html	This source gave some insight into what may be in the core of a Neutron Star, as well as defining terms such as 'quark gluon plasma'. Also provided information about the possible (hypothetical) forces that may exist in this Neutron Star core. This source provided a very good analogy for the QGP also (being the "bag theory").	We can view each nucleon as a "bag" containing quarks and gluons. These quarks and gluons can move relatively freely inside their own bag, but "bag" theory says that they cannot escape from the bag–they are "confined." For this reason, we have never been able to detect individual free quarks or gluons. However, if we are able to produce an extremely dense gas of hadrons (mainly pions and nucleons), then their bags can overlap. This overlap lets the quarks and gluons from different bags to mix freely and travel across the entire nuclear volume. We call this state a "quark-gluon plasma," in analogy with an atomic plasma in which electrons become unbound from atoms. Gravity brings the nuclei together. The short-range nuclear repulsive force is not strong enough to keep the nuclei apart. As the core collapses, the individual nucleons separate from the nucleus. The protons become neutrons by inverse beta decay. Therefore, the neutron star is very large collection of neutrons, typically a few kilometres in diameter, which is held together by gravity. Some theorists predict that a neutron star of a large enough mass could be of high enough density to produce a quark-gluon plasma.	This source is from an incredibly well known researcher with over 100 papers published and 75000 total citations. He received his PhD in Physics 45 years ago, and has been a high-quality scholar every since. However, the sources are quite old, and are not peer-reviewed (they are from Howard's personal website).	4
YouTube Video	Michel Van Biezen	What is Quark Pressure?	8/6/2022	https://www.youtube.com/watch?v=aDD8naA3dUg&list=PLX2gX-ftPVXVe2zY0QR7ehAsSc5LXOrgi&index=5	My first look at Quark Pressure - this video provided a huge amount of detail about some of the other forces inside neutron stars, and about how neutrons (stick) together without merging or repelling too much (good balance). Also gave information about how a neutron star can collapse into a black hole.	Through firing electrons at the insides of neutrons and tracking their path, scientists have detected quark pressure. As the quarks in neutron stars are +2/3 and -1/3 respectively, the electrons had different interactions depending on where they hit the neutron. This quark pressure is repulsive below 0.6fm from the centre and attractive above it (similar to SNF). At the centre, this repulsive pressure reaches roughly 10^35Pa. Above 0.6fm, the binding pressure becomes prominent. It is attractive and binds the neutrons in a neutron star together. When electrons travel through the neutron, they may collide with quarks, which release photons. They also can recoil. We measure all 3 of these things simultaneously, we can determine that it is attractive above 0.6fm. The mass of a typical neutron star isn't large enough to outweigh the quark pressure at the centre of the neutrons, however if you add more and more mass to the star (roughly 3Msun), the pressure becomes too much and the star collapses into a black hole. This usually occurs when other objects (such as moons, planets & other start), collide with the neutron star.	This source is from an online lecture in Astrophysics, and is written by a professor in Physics (who has a PhD) of over 25 years in the Loyola Marymount University. He is very well known for his large audience on YouTube and well-credited research.	4
YouTube Video	Michel Van Biezen	The Structure of a Neutron Star	8/6/2022	https://www.youtube.com/watch?v=2G4u8-o1Kyg&list=PLX2gX-ftPVXVe2zY0QR7ehAsSc5LXOrgi&index=7	Detail about the internal structure of a neutron star. Though there was not as much information that I may use in my final report, I did get a lot of detail about the particles that are in each layer of the star and their general sizes / densities.	Neutron stars are balls 20km across filled with protons, neutrons and electrons. Broken up into inner core, outer core, inner crust and outer crust. At the centre, neutrons and protons are pushed as close together as physically possible (before black hole). Inner core from 0-3km. Density > 2*avg density - may be a quark-gluon plasma, where the quarks and gluons are intermingled with each other. Outer core from 3-9km - mixture of neutrons and protons in a 'fermi liquid' (free to move around but not separated). Within them is a small amount of free electrons which create a 'fermi gas'. Inner crust from 10-11km - packed electrons, neutrons and <u>whole nuclei</u>. Outer crust from 11-20ishkm - contains <u>ions</u> and electrons - ions containing protons and neutrons with free electrons (too hot so electrons leave orbit).	Please see the above box (sources are from the same author).	4
University Lecture	Peter Jones	Getting to the Heart of Matter	24/6/2022	N/A	After speaking with my supervisor, it became clear that I should attend physics lectures on particle physics to get some higher standard & reliable research. As a result, I attended a physics sample lecture held at the University of Birmingham for their open day, which provided a lot of information on the quark-gluon plasma that it theorised to be at the centre of neutron stars. Also provided	To make a quark-gluon plasma, we slam nuclei together. As these nucleons get closer together, and therefore as the quarks get closer, the force from the gluons gets weaker (as gluons cannot exist outside a nucleus), and we can separate quarks into a plasma. Quarks interact by emitting gluons. QGP is hypothesised to be the least viscous-to-entropy ratio (almost perfect)	This source is a quote from a professor currently working at the University of Birmingham, who teaches part-time and researches part-time. They have a PhD and, as this quote was from a sample lecture at a University Open day, the material that I got my quote from will be of a very high quality and will most likely be peer-reviewed. The University that this professor works for prides themselves on having high-quality, research-led teaching.	5
University Lecture	Professor at York University	The Future of Nuclear Fusion	3/7/2022	N/A	This quote came from another university open day, this time at the physics sample lecture for the University of York. Though this topic was	Plasmas are substances where electrons don't bind to nuclei. Is a special ionised gas with a neutral sea of negative electrons and positive ions.	Please see the above box (as the information above holds true for this source).	5

Online Video	Anton Petrov	Death of Neutron Stars'	19/07/2022	https://www.youtube.com/watch?v=VtcIIfXhu3Q	This source gave me a lot of extra information about the death of neutron stars, as well as more information about pulsars (and how to detect them). I came across some new terminology here as well (such as centrifugal acceleration / force) that I will mention in my report. I learnt that Neutron Stars could exist with a mass greater than the	Pulsars are highly rotating neutron stars that emit beams of electromagnetic radiation. You can find pulsars by looking at how fast they 'pulsate'. This is because, as the neutron star absorbs more and more mass, they actually start spinning, faster and faster. The faster a neutron star spins, the more EM radiation (and therefore energy) they will release, and therefore the easier they are to detect. There is a way for a neutron star to have more mass than its limit (without collapsing). This is if a massive star goes supernova and transforms into a very large neutron star, but this star is spinning very fast. This incredibly large spin creates an external, centrifugal acceleration that actually prevents the neutron star from collapsing (opposes gravity). When this star eventually slows down, this centrifugal force decreasing and eventually the star collapses into a black hole.	This source's author is a certified mathematics & philosophy teacher with 10 years in the industry, as well as owning a large science-based YouTube channel. He was a researcher for almost two years, and an assistant researcher for over three years. However, it is unlikely that his work is peer-reviewed, and I am unable to find the sources used for this video.	2
Lecture Notes (Online)	Kevin A. Bondreaux	Quantum Numbers, Atomic Orbitals, and Electron Configurations	21/07/2022	https://www.angelo.edu/faculty/kbodreaa/general/quantum_numbers/Quantum_Numbers.htm	This source elaborated more on the Pauli Exclusion Principle, more specifically what properties go into making a fermion's wave function (which determines whether 2 fermions can share the same space).	Principle Quantum Number, Angular Momentum, Magnetic Quantum Number, Spin Quantum Number	This source is from a website containing archived lecture notes by an instructor at the department of Chemistry at a top university in Texas. Whilst the author is not a professor or researcher, lecture notes are likely to be peer-reviewed and/or heavily fact-checked - furthermore, I have fact-checked my quote from other sources on the internet.	4
Magazine Entry	The University of California'	Supercomputer Simulates Collapse of Massive Stars	22/07/2022	https://astronomy.com/news/2015/11/supercomputer-simulates-collapse-of-massive-stars	Provided information on how powerful the magnetic field of a collapsing supermassive star potentially is (for calculations with ferromagnetism).	The results of the simulation demonstrate that as a rotating star collapses, the star and its attached magnetic field spin faster and faster, forming a dynamo that revs the magnetic field to a million billion times the magnetic field of Earth.	Though only from a magazine entry, astronomy.com has renowned for having excellent quality, as it is one of the top astrophysics magazines in America. The sources have also been quality assured by a PhD astronomer.	3
University-ran Educational Website	Rod Nave	Ferromagnetism & The Curie Temperature	22/07/2022	http://hyperphysics.phy-astr.gsu.edu/hbase/Solids/ferro.html	This source filled in the gaps about Ferromagnetism - becoming a much higher-quality version of my source from the Encyclopaedia Britannica. Here, I learnt about the inner workings of ferromagnetism, the Curie Temperature and its effects.	Ferromagnetic materials exhibit a 'long-range ordering' phenomenon at the atomic level, which causes the unpaired electron spins to line up parallel with each other. This ordering comes from a quantum mechanical interaction at the atomic level. This magnetic field is intense, but not for a bulk of the material as all the fields are un parallel with each other. However, if exposed to a small magnetic field, these fields line up will each other and cause the material to become magnetised. Once this happens, the driving magnetic field is amplified by a huge amount (around 5000x). For a given ferromagnetic material, this long range order disappears at a certain temp (called the Curie temperature of the material). Iron = 1043K - gives an idea of the amount of energy it takes to break up the long-range ordering in the material.	This source's author (Rod Nave) is a PhD in Physics & Astrophysics studying & researching in Georgia University. Though it is unsure whether it is peer-reviewed, the website has been reviewed by PhysicsWorld, and has been given a "Gold Certificate" for research quality.	4
Online Blog	Peteris Tars	How Hot is a Neutron Star?	22/07/2022	https://universeexplained.com/how-hot-is-a-neutron-star/	This source stated the average temperature of a Neutron Star, both in an average day of its life and its peak temperature when it is being formed. Will be used to contract with the Curie Temperature (ferromagnetism).	The temperature of an average neutron star is about 600 000 Celsius which is more than hundred times that of the Sun. But that is just an average estimate. A newly formed neutron star can reach as high as trillion degrees Celsius (1012)	This blog is a well known publication of astronomy & astrophysics. Despite this, I wasn't able to find much information about its author, Peteris Tars, other than that he is the business development manager at PolyLabs Bio and a physics enthusiast. However, it should be known that this source only forms a very minute part of my report.	2
Astronomy Newspaper	Elizabeth Howell	When Neutron Stars Collide: Scientists Spot Kilonova Explosion from Epic 2016 Crash	27/07/2022	https://www.space.com/colliding-neutron-stars-caued-massive-kilonova-explosion.html	Here, I found my first notes on kilonova explosions - the event caused by two Neutron Stars colliding.	The precious elements were formed in a "kilonova," or an epic explosion that likely happened when two very dense stars (called neutron stars) slammed into each other.	Space.com is one of the world-leading astronomy newspapers, and has been constantly reviewed for having "authentic and reliable resources". The author of the source, Elizabeth Howell, is an assistant professor of law with a PhD in Space Studies. She has also been a lecturer at the University of Cambridge. She has been a contributing writer for Space.com for 10 years, and has even published her own books. She is known for publishing lots of peer-reviewed research	5

Physics Newspaper Extract	John J. Cowan & Friedrich-Karl Theilemann	R-Process Nucleosynthesis in Supernovae	27/07/2022	https://physicstoday.scitation.org/doi/10.1063/1.1825268	This newspaper gave lots of information, primarily on the details of r-process (which describes how heavy nuclei are formed in kilonova explosions), but also on why no elements heavier than iron are formed in a supermassive star.	binding energy per nucleon increases with nuclear mass only up to iron-56. ... the production of any heavier nuclear by direct fusion is endothermic. ... When a stable nucleus has captures enough neutrons to leave the valley of stability, it becomes unstable. Eventually, it undergoes beta decay. ... the unstable nuclei produced by the r-process will beta-decay back to the valley of stability to form the so-called stable r-process nuclei. ... [Neutron Stars colliding] ejecting a rich flux of neutrons, which may be the site of r-process.	This source is from a physics newspaper released in 2004 to "Physics Today" - thought to be "the most influential and closely followed physics magazine in the world", and is written by Physics experts - making the information of an extremely high quality. The extract is made by John Cowan, a PhD researcher with multiple rewards in outstanding teaching, and Friedrich-Karl Theilemann, a PhD theoretical astrophysicist teaching in the University of Basel. He also has over 35,000 citations and over 100 research papers published - furthermore, he has been involved in peer reviewing papers for the Nature journal.	5
Astronomy News Website	Paul M. Sutter	R-Process	27/07/2022	https://www.universetoday.com/152208/astronomy-jargon-101-r-process/	This source was my first major look into r-process, which describes how heavy nuclei are made in kilonova explosions. Provided a brief but informative look at r-process.	R-process, ... is short for rapid neutron-capture process. It happens in extreme environments. ... In space, it happens when stars go supernova or neutron stars collide. What happens during the r-process is that the seed nuclei get absolutely blasted with neutrons. The neutrons crash into the nuclei so quickly that they can build up to heavier elements before they naturally radioactively decay into lighter ones. ... While the entire process may take a week or so to sort out, the initial neutron blast is over and done with in a matter of seconds.	Universe Today' is a trusted, fact-checked astronomy news website with book publications. The author of the story, Paul Sutter, is an award winning, famous author and PhD astrophysicist who has hosted many physics TV shows and podcasts on physics topics. However, as the website's stories have not been peer-reviewed.	4
Online Magazine	Ali Sundermier	Five Extreme facts about Neutron Stars	29/07/2022	https://www.symmetrymagazine.org/article/five-extreme-facts-about-neutron-stars	I came across this newspaper completely by accident whilst going about my day. While it didn't provide a massive amount of information, I had to include this amazing fact about the energy of supernovas & stars collapsing.	In the first few seconds after a star begins its transformation into a neutron star, the energy leaving in neutrinos is equal to the total amount of light emitted by all of the stars in the observable universe (made through the conversion of protons to neutrons via electron capture).	This source is taken from an online magazine that doesn't include sources to its work. However, the magazine is a joint publication by two laboratories owned by the United States Department of Energy. These laboratories are known for their large scale, complex research - making their magazine of very high quality. The author, Ali Sundermier, has worked at one of these laboratories (SLAC) for over 4 years, and has written for many top publishers, such as the Independent Newspaper.	3
Physics QnA Website	Dr. Christopher S. Baird	Why is the centrifugal force talked about so much?	01/08/2022	https://www.wtamu.edu/~cbaird/sq/2012/12/15/why-is-the-centrifugal-force-talked-about-so-much-if-its-not-real/	From this source, I received information about the centrifugal forces acting in spinning Neutron Stars - more specifically what results from a centrifugal force.	The centrifugal force ... causes objects in a rotating frame of reference to accelerate away from the centre of rotation.	This QnA website is personally owned by Christopher Baird, a PhD assistant professor and ex senior research scientist. The author has also served as a peer reviewer for academic journals as well as for applications for NASA fellowships. Furthermore, I have personally fact-checked my information from this source.	5