

## **Introduction:**

Welcome to the American Research Center in Egypt's podcast. Through this program, we'll present the latest findings and host engaging discussions about fascinating topics in Egyptian cultural heritage. We'll be joined by world-renowned scholars in the fields of Egyptology, archaeology, Islamic, Coptic, and modern Egyptian history, and much more. If there are topics you would like to suggest for this program, email us at [podcast@arce.org](mailto:podcast@arce.org). If you enjoy the work of the American Research Center in Egypt, then learn about our other programs and activities at [www.arce.org](http://www.arce.org). You can also support our work by signing up for our mailing list, becoming a member, or donating to support our operations and projects. Today's podcast will explore King Tutankhamun's lineage and feature guest speaker Professor Aidan Dodson and Dr. Fatma Ismail, our US Director of Outreach and Programs. Thank you for joining us today.

**Ismail:** Here with us today is Professor Aidan Dodson, who is going to talk to us about the most famous Egyptian ruler, the legendary King Tutankhamun.

Professor Aidan Dodson studied at Durham, Liverpool, and Cambridge Universities, being awarded his PhD in 1995. He has taught at the University of Bristol since 1996 and has been the Honorary full Professor of Egyptology in the Department of Anthropology & Archaeology since 2018. Professor Dodson is the author of some 25 books and 300 articles and reviews. Thank you so much, Professor Dodson for accepting to spend time with us today.

**Dodson:** No problem

**Ismail:** The discovery of King Tutankhamun's tomb was definitely one of the most celebrated archaeological finds, but I would like to go back before 1922 and ask you what did we know about him before his tomb discovery. What are our earliest lines of evidence for 'King Tutankhamun', and how did we begin to piece his life-story together?

**Dodson:** Well, Tutankhamun is actually one of the earliest pharaohs Egyptologists really learn about from original Ancient Egyptian sources in the 1820s when hieroglyphs were first being deciphered. They couldn't read everything properly, but at least names could start being read. And one person in particular, um, John Gardner Wilkinson pioneer British Egyptologist spent a lot of time working at Luxor, particularly at the temple of Karnak. And he was able to start collecting the names of the various Pharaohs. He was able to find there on the various walls and on scattered blocks. And amongst those first names he found and was able to publish in his book in 1828, with the names of Tutankhamun. Now a few years previously, the first of the great monumental King list had been found. One of those in the temple of Ramesses, the second at Abydos and the preserved section of that, which is now in the British museum, included a list of the kings of the 18th dynasty and the 18th dynasty Kings were a lot of those

who Wilkinson was finding on, on his blocks at Karnak and the block with Tutankhamun's name on it, which unfortunately we don't know where it is anymore.

The name of Amenhotep III, it clearly been reused by Tutankhamun from something of his grandfather there. The problem for Wilkinson was that having seen the name on the same block as the style of the hieroglyphs, it was clear Tutankhamun ought to belong to the 18th dynasty. Yet he wasn't there on the Abydos list. Now we know from later research, of course, that Tutankhamun, Akhenaten I, and the other Kings of the Amarna period were later written out of history. And so, when the Abydos King List was being written in the reign of Ramesses II, they'd been wiped out of history, but Wilkinson didn't know that. However, he knew enough of about already about style and so on to know that Tutankhamun must be somewhere in this kind of period, and therefore to explain his absence from the King list, he wondered whether he might have been an elder brother of Amenhotep the third or another, or at least a close relative who tried to perhaps you serve people or something like that.

Because in some of the Greek stories, which are set in that kind of period, there are various disputes. So that was where Tutankhamun was for a while. Not all early Egyptologists, agreed, we will consider where he should be placed. But then as time went by over the next couple of decades and the other Kings of that period, Akhenaten himself, Ay, and so on started to become visible. Egyptologists started realizing that these people were in the gap between Amenhotep the third and Horemheb, which on the King list went straight together. As far as the Abydos King List is concerned, but the history goes Amenhotep III, Horemheb, and then onto the Ramesses. So all of this started coming together, particularly when people started exploring the areas where the monuments of Akhenaten were. And so, by the middle of the 19th century, it was clear that Tutankhamun belonged in this little group, but exactly where he fitted in was unclear.

Then as we move on through the 19th century, particularly with the excavations of Flinders Petrie at Amarna in the early 1890s, that further reinforced the view that Tutankhamun was part of this group and that he was either the successor or a successor of Akhenaten's. Also during this period, it became clear that he was the husband of Akhenaten's third daughter Ankhesenpaaten and later, Ankhesenamun. And therefore the theory was he might have been some nobleman, who'd married a king's daughter, and then when the king died without a son, but then somehow inveigled his way into becoming King, there was even a thought whether he might actually be the noble named Tutu, who we find at Amarna. Different person It turns out, but again, late 19th century, early 20th century, trying to work out what, what might be possible there.

So as far as the history is concerned, leaving aside the artistic and other things, which came out of the discovery of King Tutankhamun's tomb the big historical take away was the discovery that he wasn't a noble of, of a certain age to somehow sort of organized his way onto the

throne. But he comes to the throne at the age of nine and further by examining the mummy, it was clear he was part of the same family as Akhenaten and then the others. So therefore at that point, it became clear. He must have been a real royal prince who had married a royal princess and therefore was a proper successor to the throne rather than somebody who in some way sort of usurped their way in. But this question of course then came about as to actually what Tutankhamun's family relationships were.

**Ismail:** ...It's interesting to know that Egyptologists first learnt about King Tutankhamun almost a century before they discovered his tomb. We are about to celebrate the centennial of his tomb discovery yet there are still many mysterious things about King Tutankhamun. One of those mysteries is his parental lineage especially his mother. What does the latest research suggest about her identity? Why are most Egyptologists reasonably sure his father is Akhenaten?

**Dodson:** Okay. The idea that Tutankhamun's father is Akhenaten comes from a couple of blocks, which were found at Ashmunin, It's just opposite of Amarna by German expeditioners during the second world war. But all these blocks originally had come from Amarna when Akhenaten's regime was dismantled, the temples demand were dismantled and other Ramesses II, the various blocks were shipped across the river to be used as infill for the building projects of Ramesses II over there. Now these two blocks are the sole surviving bits, as far as we can tell from a whole wall scene with about so with 90% of the bits missing, unfortunately, but what they are, they go together. One of them says the King son of his body, his beloved Tutankhaten, which is clearly Tutankhamun's original name as a Prince and the other adjoining block names, king's daughter. And although it's damaged, it's almost certainly Ankhesenpaaten and the hieroglyphs are in opposite directions on these two blocks. So therefore the blocks go together and therefore the central part of this scene would have been Tutankhaten on one side facing Ankhesenpaaten. And presumably Akhenaten and Nefertiti and others would have been elsewhere on this wall, but that's all we can sort of visualize from the fragments there. Now from the context there and Ankhesenpaaten is called King's daughter. And we know the King in question of that is Akhenaten and therefore one's first sort of assumption on that would be therefore that the King referred to in the King son in the label text Tutankhaten and would also be Akhenaten's. There are some other ideas around this, but the vast majority of Egyptologists are happy that that logic stream works nicely.

The question of his mother is a much more open one, and there is far more debate around this than on the question of his father. Although as anybody's listening to this as well aware where it comes to the Amarna period, there is many different theories that there are Egyptologists who work on it. And so, any idea of some kind of consensus is almost impossible. So very much what I'm saying in this podcast is very much how I read the data with a few mentions of where some other people have a slightly different view. Anyway, the question about his mother now in normal circumstances, when one is trying to work out who the mother of a king is, I normally start off say, well, unless you've got any other data, it must be one of the wives of his father. And you'd normally, to start off at least with the king's great wife, which in Akhenaten's case is

Nefertiti so therefore, if this were any other period, you'd probably say, well, probably his mother would be Nefertiti.

This however has been denied by the vast majority of Egyptologists. Because when you look at the wall carvings at Amana, you have Akhenaten and Nefertiti with six children, up to six children regularly shown with them, but all girls and the view is then taken well surely given how keen, Akhenaten and Nefertiti were to show off their kids. If they had a son, he would be there in a procession along with the girls. So therefore there's been a general sort of anybody, but Nefertiti approach to seeking Tutankhamun's mother, and most people have simply then plumped for the only other wife of Akhenaten and who were aware of, or certainly aware of which is Kiya, a slightly mysterious, junior wife, who has a unique title, and name, which seems to be a, a pet form of something else. So slightly mysterious, but she's often been confidently the mother of Tutankhamun.

However, we do actually find Kiya on some temple wall blocks, particularly from Ashmunin, although she was disgraced at some point during her husband's reign. So therefore her material is far less well-preserved than the Nefertiti stuff. The trouble is that she is shown with a child matter of fact, she and Akhenaten are shown with a child in these blocks, unfortunately, it's a girl. So, if you're arguing that Nefertiti couldn't be Tutankhamun's mother, because she's never shown with a son, you can't then say, Kiya must be the mother because she's only ever with a daughter as well. So there's a slight problem around this. Now, people who argue to the, on the basis that it can't be Nefertiti because she's never shown with a son, actually show that they're not fully aware of the history of the decorum of representation of the Royal family in Egypt, because actually there is no known example of a royal son being shown in the context of a royal scene, in a tomb or a temple at any time in Egyptian history down to the time of Akhenaten, not a single example anywhere.

So therefore asking to find him shown with his mother, father and sisters on a, on a temple or two wall is asking for something which cannot exist up until this point in time. Now, when you start looking at periods around here, you start understanding what's going on during the 18<sup>th</sup> Dynasty you do occasionally you get royal sons showed on temple walls only. They're only there because of their day job, if they're a high priest or something else. They are never on a temple wall because they are the king's son. The only time you find representations of princes because their king's sons is in the tombs of their tutors where private, It's a private location where the tutor is trying to show how closely beloved he is of the king by virtue of being entrusted with the king's child to, to look after and bring up.

It's only later during the Ramesside period that we find these huge numbers of representations of the king's sons in temples Ramesses II and so on. It's also worth pointing out that if you're trying to use the argument that a son isn't shown can't exist, if he's not shown with his parents and sisters on the temple wall, we only have to go to the reign of Amenhotep III; Akhenaten's father, there in the temple of Soleb in Sudan, we have the king, Amenhotep III, his wife Queen Ti, known to be the mother of Akhenaten on multiple grounds, plus a whole bunch of the daughters of the King, but no sign of Akhenaten whatsoever. And nobody has ever tried to

argue on the basis of him not being shown in this family scene at Soleb, that Akhenaten or even his elder brother, the prematurely deceased Prince Thutmose, were not the sons of Queen Ti.

So we'll have to be very, very careful about looking at these arguments in the overall context, what we know about Egyptian representation. And in fact, on the basis of what I've just been saying there up until Akhenaten's reign, there is no sign ever anywhere of a Royal son on the temple wall, by virtue of them being purely a Royal son. These couple of blocks from Ashmunin would actually be the first ever representation of this kind. And that representation seems to come from the latter part of Akhenaten's reign. So it looks so possibly this decorum, which denies the placement of royal sons by virtue of there being loyal sons from these kinds of contexts is changed late in Akhenaten's reign. And then that then jumps forward when we get into the Ramesside period to these great processions of the, of the 50, 50 sons of Ramesses the second in his various temples. So on that basis, the, I would say the most economical solution is to say that Tutankhamun is the son of Akhenaten and Nefertiti, unless we have very convincing evidence that somebody else is.

### **Interlude:**

You are listening to the official podcast of the American Research Center in Egypt. If you need any information about our operations, please go to [arce.org](http://arce.org). Now we will go back to our episode with Professor Aidan Dodson.

**Ismail:** The Amarna family portraits are different than in other time periods of Egyptian history. They challenged many of the rules of Egyptian art and royal family representations.

....Are you saying the absence of royal male children accompanying their fathers, is intentional or a form of long practiced decorum even during the Amarna Period?

**Dodson:** What I'm saying, I think is that up until the middle part of the reign either period, when most of the representations which survive were carved, most of them sort of dates the years directly after the move to Amarna. When you just find, Akhetanen, Nefertiti, and the daughters, yes. He's still following the decorum of earlier on. However, in the last three to four years of the reign, it looked, I suspect that that changes. And there's maybe a whole range of reasons for that, but there we find towards the end, he is breaking with those thousands of years of tradition. And once he's broken that tradition, those that then gets changed much larger, much larger scale through, into the Ramesside Period.

**Ismail:** How about the complex issue of his DNA studies?

**Dodson:** The DNA studies, which were published in 2010 of various royal mummies assigned to the Amarna period is one of the big, big problem Shall we say when we're trying to assess

what's going on here. Cause there's a couple of issues here. First of all, and the problem here is that like other Egyptologist, I'm not a geneticist and I've had therefore have difficulty in fully assessing what geneticists are telling us. Now, some geneticists are still saying the ancient DNA and DNA derived from mummies is impossible. Others are saying, no, it's not. It's perfectly possible. And here we've got loads of it before we even start looking at it, the exact data which was published in 2010, one has to have in the back of one's mind, is this actually real at all? And I know I'm not qualified to say one way or the other, but there is an ongoing hot debate over whether or not ancient DNA, whether from Egyptian mummies or from anywhere else is actually real or actually is all modern contamination.

Assuming that the DNA is real, one then has to see what those conclusions from the 2010 study might say. As far as the parentage of Tutankhamun is concerned. What that study said was that his father was Akhenaten and his mother was a full blooded sister of Akhenaten and that full blooded sister is represented by the so called a younger lady; mummy from the tomb of Amenhotep II. Now that presents us with an issue on the back on the historical and artistic grounds, because in all of the material we have from Akhenaten's reign and particularly from the period where one calculates it Tutankhamun was born. There is no sign whatsoever of a sister wife of Akhenaten. We know that neither Kiya nor Neferitit was his sister. They don't hold the appropriate titles. So if Akhenaten did have a full blooded sister who he'd married and had a son by, it is almost incomprehensible, why there is no sign of her on any of the monuments of this kind of period, because as a full-blooded sister she would outrank Nefertiti and Kiya.

So what do we do with that? Well, the thing is here, that when you look more closely at the publication of the DNA results, it's clear that the publication, although it gave the raw DNA. It only gave the preferred interpretation of that DNA by the study's authors. It didn't actually say actually here is the raw DNA. This could mean A, B, or C. They simply said, our preferred solution is B or C or whatever it is rather than giving that full range. So it took a little while before, Egyptologists in particular Marc Gabolde who's done a lot of work on the Amarna Period, talks to team DNA specialist and it became clear; There are other ways of reading that raw DNA. So what it turns out is that if you've got an individual and looking at their DNA, looks like they're the offspring of a brother, sister, marriage. That same DNA signature could be generated. If, if that person's parents had been first cousins and that their parents and grandparents had also been first cousins. So three generation of first cousin marriages has an indistinguishable genetic effect on the resulting offspring from a brother, sister marriage. Now, if you take that as a model and take the view that, well, these, Akhenaten and the younger lady are then first cousins, and then look at possible interpretations of the historical evidence for the relationships of the people of the next couple of generations above them. We actually come up with something which is perfectly credible. So if the younger lady is Nefertiti and there have long been speculations that her father was Ay, the brother of queen Ti. And then we go back another generation and assume that, Yuya who was the father of queen Ti definitely. And quite possibly, of Ay, if he was a brother as has been speculated on other grounds in the past of Mutemwia, the mother of Amenhotep III, it's actually not very difficult to produce a credible family tree, which gives you that three generations of first cousins, which works nicely with the historical data. Doesn't mean we have to invent a sister wife of Akhenaten. And so

therefore, although one can't prove it. And there's always this thing in the back of one's mind about, whether the DNA is real or not. That's something which works. And it's what I do quite like about this is it works. Whether the DNA is real or not, the historical data and the DNA data are compatible here. And I think that makes a worthwhile hypothesis. We can't prove any of this. That's an important thing to bear in mind, but there's a picture which works for me as a historian and seems to work with the, the, with the genetic data as well.

**Ismail:** ...That's the issue here... because of the lack of solid conclusive evidence, other scenarios than those you suggested are possible. Overall, we can say most likely the father is Akhenaten. The mother is most likely a close family member of Akhentaen. She could be his great wife, Nefertiti, his secondary wife Kiya, one of the other minor wives, one of his elder daughters or one of his sisters actually. We know he had 8 sisters...

**Dodson:** There's no evidence he married any of them, that's the important I think we have to be. We know the only, the only wives we know of Akhenaten are Nefertiti and Kiya. Kiya has a very weird title and there's no way that she can be. Um, it seems very unlikely she was a member of the royal family at all. Whereas credibly, when you look at those various bits of other evidence, have you got time to go into easily today, which do hint, that Ay was Nefertiti's father and that all, and therefore that works. So I think like from my point of view, the best working hypothesis is Akhenaten and Nefertiti as Tutankhamun's parents. There are other options, but I think if one is trying to keep it simple, that is by far the best solution.

**Ismail:** You have a book on Nefertiti coming up soon, right?

**Dodson:** Indeed. Yes. In October Inshallah, we'll be producing, Nefertiti: Queen and Pharaoh of Egypt, Her life and Afterlife, which is the latest in a series, which was kicked off by volumes on Seti I and Ramesses III and Inshallah as well. Um, we should continue with volumes on other pharaohs over the next few years. Basically this, the idea of this series and that's how the Nefertiti one works is to start off by looking at what the evidence is for their life, for their career, for things we've just been talking about their family relationships and so on, but then having sort of got to that point, we then jumped forward 3000 years and start looking at how they were rediscovered, where we first knew that Nefertiti even existed. And then how her life story has been evolved and changed over those years. And of course, as far as Nefertiti is concerned, a big part of that is discovery of the famous painted bust now in Berlin. So that's what it's trying to look at, how she's been received by the modern world. So part one, how she lived in the ancient world, part two is how she was received by, by the modern world.

**Ismail:** That's very exciting. I'm very much looking forward to reading your book and I hope we can get a separate podcast on that to you soon.

**Dodson:** Very happy to do that. Yes.

**Ismail:** Thank you. Some scholars have suggested that some of the objects in the tomb were made for someone else. Why did they come to be buried with Tutankhamun?

**Dodson:** Okay, well it looks like about a quarter of the material from Tutankhamen's tomb was actually originally made or at least started to be made for somebody else. And that somebody else was this now clearly known to be the female King Neferneferuaten who over past few years, Egyptologists are largely agreed. Although how quarrelsome a bunch we are, there are exceptions to this, but probably the majority of us would now accept that the female King Neferneferuaten was none other than Nefertiti, who in the last few months of her husband's life had been promoted to full female Pharaoh. And in fact, her name, her full name had been for a long time Neferneferuaten Nefertiti. So when she became King should be dropped the Nefertiti part and kept Neferneferuaten.

So that is that this is the original owner of this, of most of all of this reused material, but why isn't it wasn't it used for her burial? Why was it used for Tutankhamun's ? But one of the things which we've got bear in mind here is a lot of people have stated, or at least assumed that the use, the reuse of this stuff was due to a shortage of material around the time of Tutankhamun's burial. And this stuff was sort of brought out of storage horribly reworked, and then used the tomb that I think is a complete, is completely wrong. What looks like happened and this again is a matter of debate. What, what looks like happened is that Neferneferuaten ruled alongside her, her son Tutankhaten later Tutankhamun for three or four years. She then disappears from view and isn't buried as a female Pharaoh, how she's buried is a whole matter is a whole other debate, whether she's buried pure as the queen, a princess, or just stuffed in a hole in the ground as somebody persona non grata donor.

But the key point is she is not buried as a King. Therefore, at this point, it's three or four years into Tutankhamun's reign work is, has been ongoing for a while on the manufacture of material for Tutankhamun's burial, probably in the same workshop as the Neferneferuaten stuff. Now it's just a question of which name, which Pharaoh's name, you're putting all this stuff, because every Pharaoh has their funeral equipment in progress long before they actually die. What looks like happens here is that Neferneferuaten dies, it's decided by the new powers that be that she's not going to be acknowledged as a Pharaoh in her burial. And therefore all this stuff which has been made with her name is no longer required. So it's at that point that this stuff is repurposed and diverted into Tutankhamun's outfit, which in most cases is simply a question of changing the name on it.

So probably what happens again, as far as I sort of perceive it, is that when this happens okay, what have we had what's already being made or has been made for the Tutankhamun stock of material. Is there stuff which has been completed for Neferneferuaten and which we haven't made for Tutankhamun yet, If there is, great, all we do is scrape off the name or whatever we need to do to make the adjustments and therefore, Hey, we've now got that in stock. Anything which is duplicated we've already made for Tutankhamun and also made from Neferneferuaten

and somebody probably then just scrapped. If it's not something which can, we don't want another one of it, the gold is melted down or whatever. So therefore what you then have simply is this material has that point become Tutankhamun's. So when he is buried with it, five or six years later on, it's not as though it's been special, it's any way specially selected. And hasn't been modified that said it just simply has been his for the past five or six years and just passes into the tomb along with everything else.

**Ismail:** ...The phenomena of artistic reuse is a popular theme throughout Egyptian history. From what you described it sounds like it was a practical choice to do it.

Since their discovery in 1922, Tutankhamun's treasures have been housed in the beautiful Downtown Tahrir Square Museum, what do you think about his treasures being moved to the new Grand Egyptian Museum? All the items discovered in the tomb will be put on display together for the first time.. which is a good thing but I'm curious to know your thoughts... Do you know how will they be displayed there?

**Dodson:** For most, in most terms, it's an extremely positive thing. Because as you say, it'd be the first time everything has been together since it actually came out of the tomb, because some of the material has been down left in rooms and Luxor since 1922 or, or when they finished the excavations. So yeah, everything is being put together. It's also all going through the conservation labs at the Grand Egyptian Museum, before it will go on display and from what I've seen of the artist's impressions, virtual reality, And so on of what the galleries are going to be like, it's going to be amazing with particularly the material altogether, as it was in the tomb, in the sense of burial chamber material in the same gallery. And so on. Unlike situation Tahrir where it's always been the case, that is where things can be fitted.

They've tried to put such stuff, but, you know, in given you've got those, just those fixed galleries, that's always been a bit of a problem. You've seen things next to each other, which actually were in different rooms of the original tomb. Also from the Tahrir point of view, it's suddenly means these galleries are free for other stuff. And in particular, in the last couple of years, the material of Yuya and Tjuyu the maternal grandparents Akhenaten and has all been moved actually back into the gallery they'd been thrown out of in the 1920s to make room for Tutankhamun. I've always wondered what sort of the thoughts and what there was discussions in the afterlife between Tutankhamun and his great grandparents about them being evicted from their nice gallery in the Cairo Museum to make room for his stuff.

So, so there's, there's lots of, lots of positives about it. The only concern is the transport of some of the material from Tahrir out to Giza to the Grand Egyptian Museum. As far as I know, everything's been moved so far has been moved successfully, but then when you're moving fragile material right across Cairo like that, there's always going to be concerns. And particularly there is a concern around the great wooden gilded shrines, which were erected around the king's sarcophagus. They're huge things. They're amazingly fragile. They've not really been touched since the 1920s when they first arrived in the museum at Tahrir. And I know that there are conservators who are nervous to put it mildly about how they're going to get across the

city. On the other hand, you know, lots and lots of very experienced conservators are putting their heads together over this, but that's really the only obvious negative is concerns about possible damage to material in transit.

But otherwise the Grand Egyptian Museum will finally be able to see the Tutankhamun material properly and be able to hopefully walk around all the objects rather than the frustration you sometimes found in Tahrir where you want to look at the back of something, but because of the size of the gallery, it'd been up against the wall and stuff like that. So yes, it's all a very positive thing just within the back of one's mind concerns about potential for damaging things in transit, which no matter how carefully you are on these things, there's always a danger of accidents happening. So, until everything I think is actually safely over in the Grand Egyptian Museum and in its case, there, there are going to be people who are chewing their nails to some degree about the, sort of about the safety of someone that's material.

**Ismail:** Yeah. They deserve a big bonus once everything is safely in the new museum. I don't want to be responsible for transporting his treasures or drawing his family tree either.

**Dodson:** I must say the chief conservator at the Egyptian museum at the moment is not a job I would ever want. I interned briefly in a conservation lab when I was a student and you know what you need this kind of patience and everything else and skills you need for being conservator way beyond my abilities.

**Ismail:** Thank you so much, Professor Dodson for being with us today.

**Dodson:** Great. Lovely to talk to everybody.

### **Outro:**

Thank you again for joining us to listen to the American Research Center in Egypt's podcast, and thank you as well to today's guest speaker, Professor Aidan Dodson and our US Director of Outreach and Programs, Dr. Fatma Ismail. Remember to join us for our next podcast where we will continue our series on King Tutankhamun with guest Professor Salima Ikram, who will be speaking about King Tutankhamun's tomb and its treasures. For more information about our podcast or the American Research Center in Egypt, visit our website, [www.arce.org](http://www.arce.org), or email us at [podcast@arce.org](mailto:podcast@arce.org). Thank you so much for joining us and we'll see you next time.