

Big Bang Theory Official 2017 Square Calendar Document

Big Bang Theory Official 2017 Square Calendar

The **Big Bang Theory Official 2017 Square Calendar** is an exciting collectible for fans of the hit sitcom, offering a perfect blend of functionality and fandom. Designed to capture the essence of the series, this calendar features memorable images, quotes, and moments from the show, making it an ideal addition to any fan's collection or a thoughtful gift. Whether you're organizing your year or simply celebrating your love for Sheldon, Leonard, Penny, and the rest of the gang, the 2017 square calendar offers both practical use and entertainment. In this guide, we explore the features, benefits, and why this calendar is a must-have for Big Bang Theory enthusiasts.

Overview of the Big Bang Theory Official 2017 Square Calendar

Design and Aesthetic

The 2017 square calendar is crafted with a vibrant and engaging design that captures the humor and charm of the series. Its square format provides ample space for each day, allowing fans to write notes and reminders while enjoying stunning images from the show. The calendar features a combination of high-quality photographs, character quotes, and iconic scenes, all arranged thoughtfully to appeal to fans of all ages.

Key Features

The calendar boasts several features that make it stand out:

- High-resolution images of main characters and memorable moments
- Bold, easy-to-read dates and month labels
- Dedicated space for notes and reminders
- Durable spiral binding for easy flipping
- Compact square size ideal for desks, walls, or shelves

Content Highlights of the 2017 Calendar

Character Photos and Quotes

One of the main attractions of this calendar is its diverse collection of images and quotes. Fans will enjoy seeing their favorite characters in various humorous and heartfelt moments, including:

- Sheldon Cooper's quirky expressions and scientific antics
- Leonard Hofstadter's charming smile and geeky humor
- Penny's relatable personality and iconic scenes
- Howard Wolowitz's eccentric style and humor
- Raj Koothrappali's endearing awkwardness
- Supporting characters like Amy Farrah Fowler and Bernadette Rostenkowski

Iconic Moments and Scenes

The calendar also features some of the most memorable moments from the series, such as:

- Sheldon's "Bazinga!" moments
- Leonard and Sheldon's apartment antics
- Penny's witty comebacks
- The gang's holiday celebrations
- Special episodes that defined the series

Benefits of Choosing the Big Bang Theory 2017 Square Calendar

Functional and Practical

This calendar isn't just for display; it's designed to help organize your year. Its ample space for notes allows users to jot down appointments, birthdays, and reminders, making it a practical tool for daily life.

Ideal for Fans and Collectors

As an official product, it holds value as a collectible item. Fans will appreciate the authenticity and the exclusive images that resonate with their favorite sitcom. It also makes a perfect gift for friends and family who love the series.

Enhances Home or Office Decor

With its vibrant visuals and compact square size, the calendar adds a pop of personality to any space. It's suitable for desks, kitchens, or living rooms, serving as both decor and a helpful planner.

Where to Purchase the Big Bang Theory Official 2017 Square Calendar

Online Retailers

Many online platforms offer the calendar, including:

- Amazon
- eBay
- Specialty pop culture stores
- Official Big Bang Theory merchandise websites

Physical Stores

Check local stores specializing in entertainment merchandise, gift shops, or large department stores during holiday seasons for availability.

Tips for Maximizing Your Calendar Experience

- Use the note sections to keep track of important dates like premieres or fan events.
- Pair the calendar with other Big Bang Theory merchandise, such as T-shirts, mugs, or posters, to create a themed space.
- Share the calendar with fellow fans and host viewing parties or trivia nights.
- Keep the calendar in a visible spot to regularly enjoy the series' humor and nostalgia.

Review and Feedback from Fans

Many fans who purchased the **Big Bang Theory Official 2017 Square Calendar** have praised its quality and design. Common positive points include:

- Beautifully curated images that evoke nostalgia
- Durable construction and high-quality print
- Ample space for personal notes and reminders
- Excellent value for a fan collectible

Some users have noted that it's a limited edition, making it a rare find. Others appreciate the humor and authenticity of the images, which truly capture the spirit of the series.

Conclusion: A Must-Have for Big Bang Theory Fans

The **Big Bang Theory Official 2017 Square Calendar** is more than just a way to keep track of dates; it's a celebration of one of the most beloved sitcoms of its time. Its combination of practical features and fan-centric content makes it a unique collectible and daily reminder of the series' humor, heart, and scientific genius. Whether you're a dedicated fan or a casual viewer, this calendar can brighten your year while fueling your love for the show. Be sure to check availability online or in stores, and add a touch of geeky charm to your home or office with this fantastic calendar.

Remember, a good calendar isn't just about dates—it's about celebrating what you love every single day!

Big Bang Theory Official 2017 Square Calendar: A Comprehensive Review

The Big Bang Theory Official 2017 Square Calendar stands out as a must-have collectible for fans of the beloved sitcom, seamlessly blending functional design with iconic imagery from the series. As a piece of memorabilia, this calendar not only helps organize your year but also celebrates the humor, characters, and memorable moments that made The Big Bang Theory a cultural phenomenon. In this detailed review, we'll explore every facet of the calendar—from its design and content to its practicality and overall appeal—providing you with all the information needed to determine if it's the right addition to your collection.

Introduction to the Big Bang Theory Official 2017 Square Calendar

The Big Bang Theory Official 2017 Square Calendar is a product tailored specifically for fans of the show. Released in late 2016 or early 2017, it was designed to be both a functional planner and a nostalgic tribute to the series' characters and iconic moments. Its square format distinguishes it from traditional rectangular calendars, offering a modern and compact aesthetic that complements contemporary decor.

This calendar features high-quality images, clever layouts, and a variety of themed pages that reflect the humor and spirit of the series. It's crafted with fans in mind, providing a blend of entertainment and utility that makes it a standout collectible.

Design and Layout

Format and Dimensions

- Square Format: The calendar's square shape measures approximately 12 x 12 inches, offering

a balanced visual presentation without overwhelming your space.

- Page Size: Each month is displayed on a single, well-sized page, with clear demarcations for days, dates, and special holidays.
- Material Quality: The pages are typically printed on thick, matte finish cardstock, ensuring durability and ease of writing.

Visual Aesthetics

- Cover Art: The cover often features a prominent image of the main cast—Sheldon, Leonard, Penny, Howard, Raj, Amy, and Bernadette—alongside the show's logo.
- Monthly Pages: Each month showcases a different image or scene from the series, ranging from iconic catchphrases to memorable moments.
- Color Palette: Bright, lively colors dominate, reflecting the energetic and humorous tone of the series.

Typography and Readability

- Clear, legible fonts are used for dates, days, and notes.
- Special dates such as holidays and series milestones are highlighted, aiding in quick reference.

Content and Imagery

Character Focus

- Each month typically highlights one or more main characters, often accompanied by humorous quotes or catchphrases.
- Popular characters like Sheldon Cooper, Leonard Hofstadter, Penny, Amy Farrah Fowler, Howard Wolowitz, Raj Koothrappali, Bernadette, and Stuart are featured prominently.
- The images include promotional stills, behind-the-scenes shots, or themed artwork.

Memorable Moments and Quotes

- The calendar integrates famous quotes such as Sheldon's "Bazinga!" or Leonard's "Our babies will be smart and beautiful."
- Special dates mark episodes' anniversaries or milestones, adding context and nostalgia.

Special Features

- Occasionally, the calendar includes trivia or fun facts about the series.
- Some editions incorporate fan-favorite scenes or thematic illustrations, adding depth and variety.

Practical Aspects and Usability

Organization and Functionality

- Each month includes ample space for notes, appointments, or reminders.
- The grid layout is clean, with weekends and weekdays distinctly color-coded for easy differentiation.
- Significant dates, such as holidays, birthdays, and series milestones, are marked or highlighted.

Durability and Quality

- The thick paper prevents ink bleed-through, making it suitable for writing with various pens.
- The binding between pages is sturdy, allowing the calendar to lay flat when open.
- The cover is often laminated or reinforced, ensuring it withstands handling throughout the year.

Additional Features

- Some versions include a fold-out poster or sticker sheets with series-related icons.
- The calendar may come with a built-in stand or mounting options for wall display.

Collector's Appeal and Aesthetic Value

For Fans and Collectors

- The 2017 calendar is a collectible piece, especially if it features exclusive images or limited edition artwork.
- It serves as a nostalgic reminder of the series' peak years and is ideal for display in living rooms, offices, or dedicated fan spaces.

Decorative Element

- The vibrant visuals and character imagery make it a lively addition to home or office decor.

- It complements modern interiors, especially those with a pop culture or comic theme.

Gift Potential

- This calendar makes a thoughtful gift for fans, combining practicality with fandom pride.
- It's suitable for birthdays, holidays, or as a fun surprise for The Big Bang Theory enthusiasts.

Pros and Cons

Pros:

- High-quality images and durable materials
- Well-organized layout with ample space for notes
- Features beloved characters and memorable moments
- Combines functionality with fandom expression
- Compact square format fits easily into various spaces

Cons:

- Limited to the year 2017; less useful after that year
- May not include all major holidays depending on region
- Some users might prefer a more minimalist design
- Availability could be limited since it's a dated product

Overall Impression and Final Thoughts

The Big Bang Theory Official 2017 Square Calendar is more than just a tool for managing your schedule; it's a celebration of one of the most beloved sitcoms of the 21st century. Its vibrant imagery, thoughtful layout, and fan-centric content make it an excellent collectible and functional item for dedicated followers of the series.

While its practicality remains intact for the year it was designed for, its true value lies in its nostalgic and decorative appeal. Fans will appreciate the carefully curated images, memorable quotes, and the chance to keep the spirit of The Big Bang Theory alive in their daily lives.

In conclusion, if you're a fan seeking a unique way to stay organized while showcasing your love for the series, the 2017 square calendar is a worthwhile investment. Its blend of aesthetics and utility makes it a charming addition to any fan's collection, serving as a delightful reminder of Sheldon,

Leonard, Penny, and the gang's adventures through 2017.

In essence, the Big Bang Theory Official 2017 Square Calendar offers a perfect combination of fandom homage and practical planning, making it a standout item for fans and collectors alike.

Question What is the 'Big Bang Theory Official 2017 Square Calendar'? It is a themed wall calendar featuring images and scenes from the popular TV show 'The Big Bang Theory' for the year 2017, designed in a square format. Where can I buy the 'Big Bang Theory Official 2017 Square Calendar'? You can purchase it online through retailers like Amazon, eBay, or specialty calendar stores, as well as in some physical stores that sell TV show merchandise. What characters or scenes are featured in the 2017 calendar? The calendar includes images of main characters like Sheldon, Leonard, Penny, Howard, Raj, Amy, and Bernadette, along with memorable scenes from the show. Is the 'Big Bang Theory Official 2017 Square Calendar' suitable for collectors? Yes, it is a popular item among fans and collectors of 'The Big Bang Theory' memorabilia, especially those who enjoy themed calendars. Are there any special features or bonus pages in the 2017 calendar? Some editions include bonus pages with fun facts, quotes from the show, or special images not found in standard calendars. Can I find the 'Big Bang Theory Official 2017 Square Calendar' as a digital download? Typically, this calendar is available as a physical printed product; digital versions are uncommon, but some fan-made PDFs may be available online. How does the square format of the 2017 calendar differ from traditional calendars? The square format offers a compact and visually appealing layout, often allowing for larger images and a modern look compared to standard rectangular calendars. Is the 2017 calendar still available for purchase today? Since 2017 has passed, new copies may be limited or sold out, but you might find used or collectible versions on resale platforms. What makes the 'Big Bang Theory Official 2017 Square Calendar' a popular item among fans? Its combination of iconic images, memorable quotes, and the unique square design make it a desirable collectible for fans of the show. Are there similar calendars for other years of 'The Big Bang Theory' available? Yes, calendars for other years, including 2018 and 2019, are available from various sellers, often featuring different themes and images from the show's episodes.

Related keywords: Big Bang Theory, 2017 calendar, official calendar, TV show calendar, Big Bang Theory merchandise, sitcom calendar, geeky calendar, humorous calendar, TV series planner, comedy show schedule

WHAT HAPPENED BEFORE THE BIG BANG

Understanding the Origins: What Happened Before the Big Bang?

What happened before the Big Bang? This question has fascinated scientists, philosophers, and curious minds for centuries. The Big Bang theory, which describes the rapid expansion of the universe from an extremely hot and dense initial state, is widely accepted as the beginning of our universe. However, what preceded this event remains one of the most profound mysteries in cosmology. Exploring this question involves delving into concepts from physics, quantum mechanics, and cosmology, as well as examining various theories and hypotheses that attempt to explain the universe's origins beyond the Big Bang. In this article, we'll explore these ideas in detail, shedding light on what may have existed or occurred before the universe as we know it.

The Limitations of Classical Cosmology

Understanding the Big Bang Model

The Big Bang model posits that approximately 13.8 billion years ago, the universe began as a singularity—a point of infinite density and temperature. From this initial state, space and time expanded, leading to the universe we observe today. However, this model does not specify what came before this singularity; it merely describes the evolution from that moment onward.

Why the Question of 'Before' Is Challenging

- **Singularity Problem:** Classical physics breaks down at the singularity, making it impossible to describe conditions prior to the Big Bang using traditional theories.
- **Time Itself Began:** According to general relativity, time and space are intertwined. If the universe began with the Big Bang, then asking what happened "before" might be a nonsensical question because time itself had no prior existence.
- **Limitations of Observability:** We cannot observe beyond the cosmic microwave background radiation, which provides information only about the universe as far back as approximately 380,000 years after the Big Bang.

Modern Theories Exploring 'Before' the Big Bang

1. Quantum Cosmology and the No-Boundary Proposal

One of the leading approaches to understanding what preceded the Big Bang comes from quantum cosmology, which applies principles of quantum mechanics to the universe as a whole. The Hartle-Hawking no-boundary proposal suggests that the universe is finite but without boundaries, akin to the surface of a sphere.

- **Key Idea:** The universe didn't have a 'initial' moment but emerged smoothly from a quantum

state.

- **Implication:** There was no singularity or 'before' in the traditional sense; instead, time itself becomes ill-defined at the quantum level.
- **Visualization:** Imagine the universe as a four-dimensional surface with no edges?akin to the Earth's surface?where asking about 'before' is meaningless because there is no boundary to cross.

2. The Cyclic or Oscillating Universe Models

These models propose that the universe undergoes endless cycles of expansion and contraction, often called "bounces." In this view, the Big Bang is just one phase in an eternal series of cosmic rebirths.

- Key Concepts:

- Each cycle begins with a 'Big Bounce' instead of a singularity.
- The universe expands, contracts, and then bounces back into a new expansion phase.

- **Advantages:** This avoids the problem of initial singularity and provides a framework where 'before' the Big Bang could be a previous universe.

- **Challenges:** The physics of bounces is complex and requires modifications to Einstein's general relativity, often involving quantum gravity.

3. The Multiverse Hypothesis

The multiverse theory suggests that our universe is just one of many universes existing in a vast multiverse. Some versions of this hypothesis imply that what occurred before the Big Bang might be related to processes happening in a larger multiverse framework.

- Types of Multiverses:

- Inflationary multiverse: different regions of space stop inflating at different times, creating "bubble universes."

- Quantum multiverse: different outcomes of quantum events produce separate universes.

- **Implication for 'Before':** The Big Bang could be a local event within a larger, possibly eternal, multiversal structure.

Emerging and Speculative Ideas on Pre-Big Bang Conditions

1. String Theory and Brane Cosmology

String theory, which posits that fundamental particles are one-dimensional strings, provides a framework for understanding higher-dimensional spaces. In brane cosmology, our universe might be a three-dimensional 'brane' embedded in a higher-dimensional space.

- **The Ekpyrotic Model:** Suggests that the Big Bang resulted from the collision of two branes in higher dimensions.
- **Implication:** The collision could have been the catalyst for the universe's birth, implying a pre-existing higher-dimensional universe.
- **Pre-Big Bang State:** The universe existed as separated branes prior to their collision, which caused the hot, dense state we associate with the Big Bang.

2. Quantum Fluctuations and the Birth of Universes

Quantum mechanics suggests that empty space is not truly empty but filled with fluctuations that can give rise to new universes through processes akin to quantum tunneling.

- **Quantum Tunneling:** The spontaneous formation of a universe from a quantum vacuum could be possible under certain conditions.
- **Implication:** The universe's origin might be a natural outcome of quantum processes, with no need for a classical 'before.'

Philosophical and Theological Perspectives

1. The Concept of a Creator or Prime Mover

Many religious traditions propose that a divine being or creator initiated the universe, which shifts the question of 'before' into the realm of metaphysics and theology.

2. The Infinite Regression Problem

Some philosophical arguments suggest that asking what happened before the universe leads to an infinite regress, implying that the question may be unanswerable or meaningless in a logical sense.

Conclusion: The Ongoing Quest to Understand Our Cosmic Origins

The question of what happened before the Big Bang remains one of the most intriguing and challenging in modern science and philosophy. While current theories like quantum cosmology,

cyclic models, multiverse hypotheses, and string theory provide compelling ideas, none have yet achieved definitive proof. Advances in observational technology—such as more detailed cosmic microwave background measurements, gravitational wave detection, and high-energy physics experiments—may one day shed light on this profound mystery. Until then, the question of what occurred before the universe's birth continues to inspire scientific inquiry and philosophical debate, pushing the boundaries of human understanding about our origins and the nature of reality itself.

What happened before the Big Bang has long been one of the most profound and perplexing questions in cosmology and philosophy. As scientists and thinkers delve into the origins of our universe, they grapple with concepts that challenge our understanding of time, space, and reality itself. The phrase “what happened before the Big Bang?” often evokes curiosity about the very beginning of everything we know, and whether the idea of “before?” even makes sense in this context. In this article, we will explore the various scientific theories, philosophical considerations, and historical perspectives that attempt to shed light on this cosmic mystery.

Introduction: The Enigma of the Universe's Origins

The Big Bang theory is the prevailing explanation for the origin of our universe, suggesting that approximately 13.8 billion years ago, all matter, energy, space, and time originated from an extremely hot and dense state. But this raises a fundamental question: What existed before that initial moment? Since the Big Bang marks the beginning of space and time as we understand them, asking what happened “before?” it may seem nonsensical—yet, this question has inspired countless scientific hypotheses and philosophical debates.

Why the Question Matters

Understanding what preceded the Big Bang isn't just about satisfying curiosity; it impacts our comprehension of reality, the nature of time, and the ultimate fate of the universe. If the universe had a prior state, it could influence theories on quantum gravity, multiverses, or cyclical universes. Conversely, if the Big Bang was truly the absolute beginning, it would suggest limits to human understanding and the universe itself.

Scientific Perspectives on What Happened Before the Big Bang

- The Classical View: The Singularity

The standard Big Bang model suggests that the universe began from a singularity—a point of infinite density and temperature. In classical general relativity, the equations break down at this singularity, meaning that physics as we know it cannot describe what came before.

Implication:

- The concept of 'before' is meaningless because time itself begins at the singularity.
- This leads many to conclude that asking about 'before' is a category error, akin to asking about the 'north side of the North Pole.'

- Quantum Cosmology and the No-Boundary Proposal

Quantum mechanics introduces the idea that classical concepts like singularities might not exist at the quantum level. Physicists like James Hartle and Stephen Hawking proposed the No-Boundary Proposal, suggesting that:

- The universe is finite but boundaryless.
- Time behaves like a spatial dimension near the origin, removing the need for a singularity.
- The universe 'smoothly' emerged from a quantum state, eliminating the question of what happened 'before.'

Key Takeaway:

- In this view, asking about 'before' the Big Bang is akin to asking about the 'edge' of the universe—meaningless because there is no boundary.

- Cyclic and Oscillating Universe Models

Some theories propose that the universe undergoes endless cycles of expansion and contraction, often called oscillatory or cyclic models.

Notable Models Include:

- The ekpyrotic universe, which suggests our universe resulted from a collision of higher-dimensional branes.
- The Conformal Cyclic Cosmology (CCC) proposed by Roger Penrose, where each universe phase transitions into the next, with no true beginning or end.

Implication:

- The universe might have existed forever, with the Big Bang being just one phase in an eternal cycle.

- "Before" the Big Bang could be the previous cycle's contraction phase.

- Multiverse Hypotheses

Some theories extend the scope beyond our universe, suggesting a multiverse—a vast ensemble of universes with different physical laws or constants.

Implications for "Before the Big Bang":

- The Big Bang in our universe might be just one event among many, possibly triggered by processes in a higher-dimensional space or a different universe.

- The question shifts from "what happened before?" to "what caused the multiverse to come into existence?"

Philosophical and Conceptual Challenges

The Nature of Time

In modern physics, time is intertwined with space into spacetime. Theories like general relativity treat time as a dimension similar to space, but quantum theories and cosmological models complicate this picture.

Key Issues:

- If time began at the Big Bang, then asking about "before" is meaningless because time itself didn't exist.

- Some models suggest time is emergent, arising only after a certain quantum threshold, making "before" a non-issue.

Causality and Infinity

Questions about the universe's origin often involve causality—what caused the universe? Is the universe itself infinite in the past? These issues challenge our understanding of cause-and-effect relationships.

Common philosophical stances include:

- The universe has a cause (a divine creator, a quantum fluctuation, etc.).
- The universe is its own cause or has no cause (self-originating).
- The universe is infinite in the past, with no beginning.

Visualizing Different Theories

| Theory | Main Idea | What it suggests about "before" | Key Implication |

|-----|-----|-----|-----|

| Singularity | The universe started from an infinite density point | No "before," as time begins at the singularity | Limits of physics, classic model |

| No-Boundary | Universe is finite but boundaryless | No "before," time is emergent | Quantum cosmology removes boundary |

| Cyclic | Universe undergoes endless cycles | "Before" is the previous cycle's end | Infinite past, eternal universe |

| Multiverse | Many universes exist | "Before" is outside our universe | Broader cosmic context |

Recent Advances and Future Directions

- Quantum Gravity and String Theory

Progress in theories like string theory and loop quantum gravity aims to unify quantum mechanics with gravity, potentially resolving the singularity problem and shedding light on pre-Big Bang conditions.

- Observational Evidence

While directly observing "before the Big Bang" is impossible, scientists look for indirect clues:

- Cosmic microwave background (CMB) anomalies.
- Gravitational wave signatures.
- Imprints of prior cycles or multiverse interactions.

- Philosophical and Theoretical Challenges

Continued debate revolves around whether the question itself is meaningful or if new physics will redefine our understanding of beginnings.

Conclusion: The Ongoing Quest to Understand Our Origins

The question of what happened before the Big Bang remains one of the most intriguing and challenging in science and philosophy. While current models offer tantalizing hints—ranging from quantum origins to cyclic universes—they also highlight the limits of our understanding. As our theories evolve and observational techniques improve, we may inch closer to uncovering the true nature of our cosmic origins, or perhaps accept that some questions are beyond the reach of human comprehension. Until then, the mystery persists, inspiring curiosity and wonder about the profound beginnings of everything we know.

Question Is there any scientific evidence about what happened before the Big Bang? **Answer** Currently, there is no direct scientific evidence about what occurred before the Big Bang, as our understanding is limited to the moments after it began. Theories like cosmic inflation and quantum gravity aim to explore this, but definitive answers remain elusive. Can the concept of time exist before the Big Bang? Most models suggest that time itself started with the Big Bang, meaning 'before' may not be a meaningful concept within our current understanding of physics. Some theories propose a pre-Big Bang state, but these ideas are still speculative. What are the leading scientific theories about what preceded the Big Bang? Leading theories include the cyclic universe model, which proposes an eternal series of expansions and contractions, and the idea of a multiverse, where our universe is just one of many. However, these remain hypotheses without conclusive evidence. How does quantum mechanics contribute to understanding what happened before the Big Bang? Quantum mechanics introduces ideas like quantum fluctuations and the possibility of a quantum origin of the universe, suggesting that the universe may have emerged from a quantum state. Nonetheless, integrating quantum mechanics with cosmology is an ongoing challenge. Is it possible that the universe had a different origin than the Big Bang theory suggests? Yes, alternative models like the 'big bounce' or pre-Big Bang scenarios propose different origins. These models aim to address gaps in the Big Bang theory but are not yet widely confirmed by observational evidence. What role do cosmic inflation theories play in understanding what happened before the Big Bang? Inflation theories describe a rapid exponential expansion shortly after the Big Bang but do not specify what preceded it. Some models extend inflation backward in time, but the exact conditions before inflation remain speculative. Are there philosophical or metaphysical perspectives on what existed before the Big Bang? Yes, some philosophical and metaphysical perspectives consider the possibility of a timeless universe, a divine creation, or other existential concepts. These ideas often go beyond empirical science and delve into metaphysics and spirituality.

Related keywords: cosmology, universe origins, primordial universe, quantum fluctuations, early universe, pre-Big Bang theories, cosmic inflation, multiverse, singularity, spacetime genesis

Read the full article online: [what happened before the big bang](#)