

# Interstellar (film)

## Interstellar



Theatrical release poster

**Directed by** [Christopher Nolan](#)

**Written by**

- [Jonathan Nolan](#)
- Christopher Nolan

**Produced by**

- [Emma Thomas](#)
- Christopher Nolan
- [Lynda Obst](#)

**Starring**

- [Matthew McConaughey](#)
- [Anne Hathaway](#)
- [Jessica Chastain](#)
- [Bill Irwin](#)
- [Ellen Burstyn](#)
- [Michael Caine](#)

**Cinematography** [Hoyte van Hoytema](#)

**Edited by** [Lee Smith](#)

**Music by** [Hans Zimmer](#)

**Production companies**

- [Paramount Pictures](#)
- [Warner Bros. Pictures](#)

- [Legendary Pictures](#)
- [Syncopy Inc.](#)
- Lynda Obst Productions

## Distributed by

- Paramount Pictures (United States and Canada)
- Warner Bros. Pictures (International)

## Release dates

- October 26, 2014 ( [TCL Chinese Theatre](#) )
- November 5, 2014 (United States)
- November 7, 2014 (United Kingdom)

**Running time** 169 minutes [\[1\]](#)

## Countries

- United Kingdom [\[2\]](#)
- United States [\[2\]](#)

**Language** English

**Budget** \$165 million [\[3\]](#)

**Box office** \$758.6 million [\[3\]](#)

*Interstellar* is a 2014 [epic science fiction film](#) directed by [Christopher Nolan](#), who co-wrote the screenplay with his brother [Jonathan](#). It features an [ensemble cast](#) led by [Matthew McConaughey](#), [Anne Hathaway](#), [Jessica Chastain](#), [Bill Irwin](#), [Ellen Burstyn](#), and [Michael Caine](#). Set in a [dystopian](#) future where Earth is suffering from catastrophic [blight](#) and famine, the film follows a group of astronauts who travel through a [wormhole](#) near [Saturn](#) in search of a new home for mankind.

The screenplay had its origins in a script Jonathan developed in 2007 and was originally set to be

directed by [Steven Spielberg](#). Theoretical physicist [Kip Thorne](#) was an executive producer and scientific consultant on the film, and wrote the tie-in book [The Science of Interstellar](#). It was [Lynda Obst](#)'s final film as producer before her death. Cinematographer [Hoyte van Hoytema](#) shot it on [35 mm film](#) in the [Panavision anamorphic format](#) and [IMAX](#) 70 mm. Filming began in late 2013 and took place in [Alberta](#), [Klaustur](#), and [Los Angeles](#). *Interstellar* uses extensive practical and [miniature effects](#), and the company [DNEG](#) created additional [digital effects](#).

*Interstellar* premiered at the [TCL Chinese Theatre](#) on October 26, 2014, and was released in theaters in the United States on November 5, and in the United Kingdom on November 7. In the United States, it was first released on [film stock](#), expanding to venues using [digital projectors](#). The film received generally positive reviews from critics and was a commercial success, grossing \$681 million worldwide during its initial theatrical run, and \$758.6 million worldwide with subsequent releases, making it the [tenth-highest-grossing film of 2014](#). Among its [various accolades](#), *Interstellar* was nominated for five awards at the [87th Academy Awards](#), winning [Best Visual Effects](#).

In the mid-21st century, humanity faces [extinction](#) due to [dust storms](#) and widespread crop [blights](#). Joseph Cooper, a widowed former [NASA](#) test pilot, works as a farmer and raises his children, Murph and Tom, alongside his father-in-law Donald. Living in a [post-truth society](#), Cooper is reprimanded by Murph's teachers for telling her that the [Apollo missions](#) were not fabricated. During a dust storm, the two discover that dust patterns in Murph's room, which she first attributes to a [ghost](#), result from a gravitational anomaly, and translate into [geographic coordinates](#). These lead them to a secret NASA facility headed by Professor John Brand, who explains that, 48 years earlier, a [wormhole](#) appeared near [Saturn](#), leading to a system in another [galaxy](#) with twelve potentially habitable planets located near a [black hole](#) named Gargantua. Volunteers of the *Lazarus* expedition had previously travelled through the wormhole to evaluate the planets, with Miller,

Edmunds, and Mann reporting back desirable results.

Cooper is enlisted to pilot the *Endurance* [spacecraft](#) through the wormhole as part of a mission to colonize a [habitable planet](#) with 5000 [frozen embryos](#) and ensure humanity's survival. Meanwhile, Professor Brand would continue his work on solving a gravity equation whose solution would supposedly enable construction of spacecraft for an exodus from Earth. Cooper accepts against Murph's wishes and promises to return. When she refuses to see him off, he leaves her his wristwatch to compare their [relative time](#) when he returns.

The crew, consisting of Cooper, robots TARS and CASE, and scientists Dr. Amelia Brand (Professor Brand's daughter), Romilly, and Doyle, traverse the wormhole after a two-year voyage to Saturn. Cooper, Doyle and Brand use a [lander](#) to investigate Miller's planet, where time is severely [dilated](#). After landing in knee-high water and finding only wreckage from Miller's expedition, a gigantic [tidal wave](#) kills Doyle and waterlogs the lander's engines.

By the time they leave the planet, Cooper and Brand discover that 23 years have elapsed on the *Endurance*. Having enough fuel left for only one of the other two planets, Cooper and Romilly decide to go to Mann's, as he is still broadcasting, despite Brand's protests. En route, they receive messages from Earth and Cooper watches Tom grow up, get married, and lose his first son. An adult Murph is now a scientist working on the gravity equation with Professor Brand. On his deathbed, Brand confesses that the *Endurance* crew was never supposed to return, knowing that a complete solution to the equation was not feasible without observations of [gravitational singularities](#) from inside a black hole.

On Mann's planet, they awaken him from [cryostasis](#), and he assures them that colonization is possible, despite the extreme environment. During a scouting mission, Mann attempts to kill Cooper and reveals that he falsified his data in the hope of being rescued. He steals Cooper's lander and heads for the *Endurance*. While a [booby trap](#)

set by Mann kills Romilly, Brand rescues Cooper with the other lander and they race back to the *Endurance*. Mann is killed in a failed manual docking operation, severely damaging the *Endurance*, but Cooper is able to regain control of the station through his own docking maneuver.

With insufficient fuel, Cooper and Brand resort to a [slingshot](#) around Gargantua, which costs them 51 years due to time dilation. In the process, Cooper and TARS jettison their landers to lighten the *Endurance* so that Brand and CASE may reach Edmunds' planet. Falling into Gargantua's [event horizon](#), they eject from their craft and find themselves in a [tesseract](#) made up of infinite copies of Murph's bedroom across moments in time. Cooper deduces that the tesseract was constructed by advanced humans in the far future, and realizes that he had always been Murph's "ghost". He uses [Morse code](#) to manipulate the second hand of the wristwatch he gave her before he left, giving Murphy the data that TARS collected, which enables her to complete Brand's solution.

The tesseract, its purpose fulfilled, collapses before ejecting Cooper and TARS. Cooper wakes up on a [station](#) orbiting Saturn. He reunites with Murph, now elderly and on her deathbed, who tells him to seek out Brand. Cooper and TARS take a spacecraft to rejoin Brand and CASE, who are setting up the human colony on Edmunds' habitable planet.



- [Matthew McConaughey](#) as Joseph "Coop" Cooper, [\[a\]](#) a widowed [NASA](#) pilot who reluctantly becomes a farmer after the agency was closed by the government, and eventually joins the *Endurance* mission as the lead pilot
- [Anne Hathaway](#) as Dr. Amelia Brand, Professor Brand's daughter and NASA scientist who, aboard the *Endurance* mission, is responsible for conducting planet colonization [\[4\]](#)

- [Jessica Chastain](#) as Murphy "Murph" Cooper, Joseph's daughter, who eventually becomes a NASA scientist working under Professor Brand
  - [Ellen Burstyn](#) as elderly Murph
  - [Mackenzie Foy](#) as 10-year-old Murph
- [John Lithgow](#) as Donald, Cooper's elderly father-in-law
- [Michael Caine](#) as Professor John Brand, a high-ranking NASA scientist, father of Amelia, former mentor of Cooper, and director of the *Lazarus* and *Endurance* missions
- [Casey Affleck](#) as Tom Cooper, Joseph's son, who eventually takes charge of his father's farm
  - [Timothée Chalamet](#) as 15-year-old Tom
- [Wes Bentley](#) as Doyle, a high-ranking NASA member, and *Endurance* crew member
- [Bill Irwin](#) as TARS (voice and puppetry) and CASE (puppetry), robots assigned to assist the crew of the *Endurance*
- [Topher Grace](#) as Getty, Murph's colleague and love interest
- [David Gyasi](#) as Professor Romilly, a high-ranking NASA member, and *Endurance* crew member
- [Matt Damon](#) as Dr. Mann, a NASA astronaut sent to an icy planet during the *Lazarus* program

Also appearing are [Josh Stewart](#) as the voice of CASE; [Leah Cairns](#) as Lois, Tom's wife; Liam Dickinson as Coop, Tom's son; [David Oyelowo](#) and [Collette Wolfe](#) respectively as school principal and teacher Ms. Hanley; [Francis X. McCarthy](#) as farmer "Boots"; [William Devane](#) as Williams, another NASA member; [Elyes Gabel](#) as Cooper Station Administrator; and [Jeff Hephner](#) as Cooper Station Doctor.

## Development and financing

[ [edit](#) ]

The premise for *Interstellar* was conceived by the producer [Lynda Obst](#) and the theoretical physicist [Kip Thorne](#), who collaborated on the film *Contact*

(1997), and had known each other since [Carl Sagan](#) set them up on a blind date. <sup>[5][6]</sup> The two conceived a scenario, based on Thorne's work, about "the most exotic events in the universe suddenly becoming accessible to humans", and attracted [Steven Spielberg](#)'s interest in directing. <sup>[7]</sup> The film began development in June 2006, when Spielberg and [Paramount Pictures](#) announced plans for a science-fiction film based on an eight-page treatment written by Obst and Thorne. Obst was attached to produce. <sup>[8][9]</sup> By March 2007, Jonathan Nolan was hired to write a [screenplay](#). <sup>[10]</sup>

After Spielberg moved his production studio, [DreamWorks](#), from Paramount to [Walt Disney Studios](#) in 2009, Paramount needed a new director for *Interstellar*. Jonathan Nolan recommended his brother Christopher, who joined the project in 2012. <sup>[11]</sup> Christopher Nolan met with Thorne, then attached as executive producer, to discuss the use of [spacetime](#) in the story. <sup>[12]</sup> In January 2013, Paramount and Warner Bros. announced that Christopher Nolan was in negotiations to direct *Interstellar*. <sup>[13]</sup> Nolan said he wanted to encourage the goal of [human spaceflight](#). <sup>[14]</sup> and intended to merge his brother's screenplay with his own. <sup>[15]</sup> By the following March, Nolan was confirmed to direct *Interstellar*, which would be produced under his label [Syncopy](#) and [Lynda Obst Productions](#). <sup>[16]</sup> *The Hollywood Reporter* said Nolan would earn a salary of \$20 million against 20% of the total gross. <sup>[17]</sup> To research for the film, Nolan visited NASA and the [private space program](#) at [SpaceX](#). <sup>[12]</sup>

Warner Bros. sought a stake in Nolan's production of *Interstellar* from Paramount, despite their traditional rivalry, and agreed to give Paramount its rights to co-finance the next film in the *Friday the 13th* horror franchise, with a stake in a future film based on the television series *South Park*. Warner Bros. also agreed to let Paramount co-finance an indeterminate "A-list" property. <sup>[18]</sup> In August



2013, [Legendary Pictures](#) finalized an agreement with Warner Bros. to finance approximately 25% of the film's production. Although it failed to renew its eight-year production partnership with Warner Bros., Legendary reportedly agreed to forgo financing [Batman v Superman: Dawn of Justice](#) (2016) in exchange for the stake in *Interstellar*. <sup>[19]</sup>

## Writing and casting

[ [edit](#) ]



The [Dust Bowl](#) phenomenon of the 1930s, as documented by [Ken Burns](#) in *The Dust Bowl* (2012), served as inspiration for the blight.

Jonathan Nolan worked on the script for four years. <sup>[5]</sup> To learn the scientific aspects, he studied [relativity](#) at the [California Institute of Technology](#). <sup>[20]</sup> He was pessimistic about the [Space Shuttle program](#) ending and how NASA lacked financing for a [human mission to Mars](#), drawing inspiration from science-fiction films with [apocalyptic](#) themes, such as *WALL-E* (2008) and *Avatar* (2009). Jeff Jensen of *Entertainment Weekly* said: "He set the story in a dystopian future ravaged by blight, but populated with hardy folk who refuse to bow to despair." <sup>[11]</sup>

His brother Christopher had worked on other science fiction scripts but decided to take the *Interstellar* script and choose among the vast array of ideas presented by Jonathan and Thorne. He picked what he felt, as director, he could get "across to the audience and hopefully not lose them", before he merged it with a script he had worked on for years on his own. <sup>[12]</sup> <sup>[21]</sup> Among the elements from the original script that Christopher removed was how gravitational waves

were used for detecting the wormhole—and then regretted it after LIGO detected gravitational waves just little over a year later. <sup>[22]</sup> He kept in place Jonathan's conception of the first hour, which is set on a [resource-depleted](#) Earth in the near future. The setting was inspired by the [Dust Bowl](#) that took place in the United States during the [Great Depression](#) in the 1930s. <sup>[5]</sup> He revised the rest of the script, where a team travels into space, instead. <sup>[5]</sup> After watching the 2012 documentary *The Dust Bowl* for inspiration, Christopher contacted the director, [Ken Burns](#), and the producer, Dayton Duncan. They granted him permission to use some of their featured interviews in *Interstellar*. <sup>[23]</sup>

Christopher Nolan wanted an actor who could bring to life his vision of the main character as an [everyman](#) with whom "the audience could experience the story". <sup>[24]</sup> He became interested in casting [Matthew McConaughey](#) after watching him in an early cut of the 2012 film *Mud*, <sup>[24]</sup> which he had seen as a friend of one of its producers, Aaron Ryder. <sup>[5]</sup> Nolan went to visit McConaughey while he was filming for the TV series *True Detective*. <sup>[25]</sup> [Anne Hathaway](#) was invited to Nolan's home, where she read the script for *Interstellar*. <sup>[26]</sup> In early 2013, both actors were cast in the starring roles. <sup>[27]</sup> [Jessica Chastain](#) was contacted while she was working on *Miss Julie* (2014) in Northern Ireland, and a script was delivered to her. <sup>[26]</sup> Originally, [Irfan Khan](#) was offered the role of Dr. Mann but rejected it due to scheduling conflicts. [Matt Damon](#) was cast as Mann in late August 2013 and completed filming his scenes in Iceland. <sup>[28]</sup>

## Principal photography

[ [edit](#) ]

Nolan shot *Interstellar* on 35 mm film in the [Panavision anamorphic format](#) and [IMAX](#) 70 mm photography. <sup>[29]</sup> Cinematographer [Hoyte van Hoytema](#) was hired for *Interstellar*, as [Wally Pfister](#), Nolan's cinematographer on all of his

previous films, was making his directorial debut working on [Transcendence](#) (2014); [\[30\]](#) Pfister would later retire as a cinematographer for films. [\[31\]](#) More IMAX cameras were used for *Interstellar* than for any of Nolan's previous films. To minimize the use of [computer-generated imagery](#) (CGI), Nolan had practical locations built, such as the interior of a space shuttle. [\[24\]](#) Van Hoytema retooled an IMAX camera to be [hand-held](#) for shooting interior scenes. [\[5\]](#) Some of the film's sequences were shot with an IMAX camera installed in the nose cone of a [Learjet](#). [\[32\]](#) Nolan, who is known for keeping details of his productions secret, strove to ensure secrecy for *Interstellar*. Writing for [The Wall Street Journal](#), Ben Fritz stated, "The famously secretive filmmaker has gone to extreme lengths to guard the script to ... *Interstellar*, just as he did with the blockbuster *Dark Knight* trilogy." [\[33\]](#) As one security measure, *Interstellar* was filmed under the name *Flora's Letter*, [\[34\]](#) Flora being one of Nolan's four children with producer Emma Thomas. [\[12\]](#)



The Svínafellsjökull glacier in [Iceland](#) was used as a filming location for *Interstellar*, doubling for Mann's planet.

The film's [principal photography](#) was scheduled to last four months. [\[28\]](#) It began on August 6, 2013, in the province of [Alberta](#), Canada. [\[19\]](#) Towns in Alberta where shooting took place included [Nanton](#), [Longview](#), [Lethbridge](#), [Fort Macleod](#), and [Okotoks](#). In Okotoks, filming took place at the [Seaman Stadium](#) and the Olde Town Plaza. [\[34\]](#) For a cornfield scene, production

designer [Nathan Crowley](#) planted 500 acres (200 ha) of corn that would be destroyed in an apocalyptic [dust storm](#) scene, [\[11\]](#) intended to be similar to storms experienced during the Dust Bowl in 1930s America. [\[12\]](#) Additional scenes involving the dust storm and McConaughey's character were also shot in [Fort Macleod](#), where the giant dust clouds were created on location using large fans to blow [cellulose-based](#) synthetic dust through the air. [\[35\]](#) Filming in the province lasted until September 9, 2013, and involved hundreds of extras in addition to 130 crew members, most of whom were local. [\[34\]](#)

Shooting also took place in Iceland, where Nolan had previously filmed scenes for [Batman Begins](#) (2005). [\[36\]](#) It was chosen to represent two extraterrestrial planets: one covered in ice, and the other in water. [\[5\]](#) The crew transported mock spaceships weighing about 10,000 pounds (4,500 kg). [\[12\]](#) They spent two weeks shooting there, [\[28\]](#) during which a crew of about 350 people, including 130 locals, worked on the film. Locations included the Svínafellsjökull glacier and the town of [Klaustur](#). [\[37\]](#) [\[38\]](#) While filming a water scene in Iceland, Hathaway almost suffered from [hypothermia](#) because her [dry suit](#) had not been properly secured. [\[12\]](#)

After the schedule in Iceland was completed, the crew shot in Los Angeles for 54 days. Filming locations included the [Westin Bonaventure Hotel](#) and Suites, the [Los Angeles Convention Center](#), a Sony Pictures [soundstage](#) in [Culver City](#), and a private residence in [Altadena, California](#). [\[39\]](#) Principal photography concluded in December 2013. [\[40\]](#) Production had a budget of \$165 million, \$10 million less than was allotted by Paramount, Warner Bros., and Legendary Pictures. [\[12\]](#)



*Interstellar* features three spacecraft—the *Endurance*, a ranger, and a lander. The *Endurance*, the crew's [mother ship](#), is a circular structure consisting of 12 capsules, laid flat to mimic a clock: Four capsules with planetary settling equipment, four with engines, and four with the permanent functions of cockpit, medical labs, and habitation. Production designer Nathan Crowley said the *Endurance* was based on the [International Space Station](#): "It's a real mish-mash of different kinds of technology. You need analogue stuff, as well as digital stuff, you need backup systems and tangible switches. It's really

like a submarine in space. Every inch of space is used, everything has a purpose." The ranger's function is similar to the [Space Shuttle](#)'s, being able to enter and exit planetary atmospheres. Lastly, the lander transports the capsules with settling equipment to planetary surfaces. Crowley compared it to "a heavy Russian helicopter." [\[5\]](#)

The film features two robots, CASE and TARS, as well as a dismantled third robot, KIPP. Nolan wanted to avoid making the robots [anthropomorphic](#) and chose a 1.5 m (4.9 ft) [quadrilateral](#) design. He said: "It has a very complicated design philosophy. It's based on mathematics. You've got four main blocks and they can be joined in three ways. So, you have three combinations you follow. But then within that, it subdivides into a further three joints. And all the places we see lines—those can subdivide further. So you can unfold a finger, essentially, but it's all proportional." [Bill Irwin](#) voiced and physically controlled both robots, with his image digitally removed, and [Josh Stewart](#) replaced his voicing for CASE. [\[5\]](#) The human space habitats resemble [O'Neill cylinders](#), a theoretical [space habitat](#) model proposed by physicist [Gerard K. O'Neill](#) in 1976. [\[41\]](#)

[Gregg Landaker](#) and [Gary Rizzo](#) were the film's [audio engineers](#) tasked with [audio mixing](#), while sound editor [Richard King](#) supervised the process. [\[42\]](#) Christopher Nolan sought to mix the sound to take maximum advantage of theater equipment [\[43\]](#) and paid close attention to designing the sound mix, like focusing on the sound of buttons being pressed with astronaut suit gloves. [\[11\]](#) The studio's website stated that the film was "mixed to maximize the power of the low-end frequencies in the main channels, as well as in the [subwoofer](#) channel." [\[44\]](#) Nolan deliberately intended some dialogue to seem drowned out by ambient noise or music, causing some theaters to post notices emphasizing that this effect was intentional and not a fault in their equipment. [\[45\]](#)

[Hans Zimmer](#), who scored Nolan's [The Dark Knight Trilogy](#) and [Inception](#) (2010), returned to



score *Interstellar* . Nolan chose not to provide Zimmer with a script or any plot details but instead gave him a single page that told the story of a father leaving his child for work. It was through this connection that Zimmer created the early stages of the *Interstellar* soundtrack. Zimmer and Nolan later decided the 1926 four-manual

[Harrison & Harrison](#) organ of the [Temple Church](#) , London, would be the primary instrument for the score. <sup>[46]</sup><sup>[47]</sup> Zimmer conducted 45 scoring sessions for *Interstellar* , three times more than for *Inception* . The soundtrack was released on November 18, 2014. <sup>[11]</sup>

The visual effects company [Double Negative](#) , which worked on *Inception* , was brought back for *Interstellar* . <sup>[48]</sup> According to visual effects supervisor [Paul Franklin](#) , the number of effects in the film was not much greater than in Nolan's *The Dark Knight Rises* (2012) or *Inception* . However, for *Interstellar* , they created the effects first, allowing digital projectors to display them behind the actors, rather than having the actors perform in front of [green screens](#) . <sup>[5]</sup> The film contained 850 visual-effect shots at a resolution of 5600 × 4000 lines: 150 shots that were created in-camera using digital projectors, and another 700 were created in post-production. Of those, 620 were presented in IMAX, while the rest were anamorphic. <sup>[49]</sup>

The ranger, *Endurance* , and lander spacecraft were created using [miniature effects](#) by Nathan Crowley in collaboration with effects company New Deal Studios, as opposed to using computer-generated imagery, as Nolan felt they offered the best way to give the ships a tangible presence in space. [3D-printed](#) and hand-sculpted, the scale models earned the nickname "maxatures" by the crew due to their immense size; the 1/15th-scale miniature of the *Endurance* module spanned over 7.6 m (25 ft), while a [pyrotechnic](#) model of part of the craft was built at 1/5th scale. The Ranger and Lander miniatures spanned 14 m (46 ft) and over 15 m (49 ft), respectively, and were large enough for van Hoytema to mount IMAX cameras directly onto the spacecraft, thus mimicking the look of NASA IMAX documentaries. The models were

then attached to a six-axis [gimbal](#) on a motion control system that allowed an operator to manipulate their movements, which were filmed against background plates of space using [VistaVision](#) cameras on a smaller motion control rig. <sup>[50]</sup> New Deal Studio's miniatures were used in 150 special effects shots. <sup>[49]</sup>

Nolan was influenced by what he called "key touchstones" of science fiction cinema, including *Metropolis* (1927), *2001: A Space Odyssey* (1968), *Blade Runner* (1982), <sup>[51]</sup> *Star Wars* (1977), and *Alien* (1979). <sup>[52]</sup> [Andrei Tarkovsky](#) 's *The Mirror* (1975) influenced "elemental things in the story to do with wind and dust and water", according to Nolan, <sup>[53]</sup> who also compared *Interstellar* to *The Treasure of the Sierra Madre* (1948) as a film about human nature. <sup>[54]</sup> He sought to emulate films like [Steven Spielberg](#) 's *Jaws* (1975) and *Close Encounters of the Third Kind* (1977) for being family-friendly but also "as edgy and incisive and challenging as anything else on the blockbuster spectrum". He screened *The Right Stuff* (1983) for the crew before production, <sup>[5]</sup> following in its example by capturing reflections on the *Interstellar* astronauts' visors. For further inspiration, Nolan invited former astronaut [Marsha Ivins](#) to the set. <sup>[12]</sup> Nolan and his crew studied the IMAX NASA documentaries of filmmaker [Toni Myers](#) for visual reference of spacefaring missions, and strove to imitate their use of IMAX cameras in the enclosed spaces of spacecraft interiors. <sup>[55]</sup> [Clark Kent](#) 's upbringing in *Man of Steel* (2013) was the inspiration for the farm setting in the Midwest. <sup>[21]</sup> Apart from the films, Nolan drew inspiration from the architecture of [Ludwig Mies van der Rohe](#) . <sup>[12]</sup>

## Scientific accuracy

[ [edit](#) ]





[Kip Thorne](#), a theoretical physicist and Nobel Laureate, served as scientific consultant and executive producer.

Regarding the concepts of wormholes and black holes, Kip Thorne said he "worked on the equations that would enable tracing of light rays as they traveled through a wormhole or around a black hole—so what you see is based on [Einstein's general relativity equations](#)". <sup>[56]</sup> Early in the process, Thorne laid down two guidelines: "First, that nothing would violate established physical laws. Second, that all the wild speculations [...] would spring from science and not from the fertile mind of a screenwriter." Nolan accepted these terms as long as they did not get in the way of making the film. <sup>[9]</sup> At one point, Thorne spent two weeks arguing Nolan out of having a character traveling faster than light before Nolan finally gave up. <sup>[57]</sup> According to Thorne, the element that has the highest degree of artistic freedom is the clouds of ice on one of the planets they visit, which are structures that would go beyond the material strength that ice could support. <sup>[9]</sup>

The astrobiologist [David Grinspoon](#) criticized the dire "blight" situation on Earth portrayed in the early scenes, pointing out that even with a voracious blight it would have taken millions of years to reduce the atmosphere's oxygen content. He also notes that gravity should have pulled down the ice clouds. <sup>[58]</sup> [Neil deGrasse Tyson](#),

an [astrophysicist](#), explored the science behind the ending of *Interstellar*, concluding that it is theoretically possible to interact with the past, and that "we don't really know what's in a black hole, so take it and run with it". <sup>[59]</sup> The theoretical physicist [Michio Kaku](#) praised the film for its scientific accuracy and said *Interstellar* "could set the gold standard for science fiction movies for years to come". Timothy Reyes, a former NASA [software engineer](#), said "Thorne's and Nolan's accounting of black holes and wormholes and the use of gravity is excellent". <sup>[60]</sup>

## Wormholes and black holes

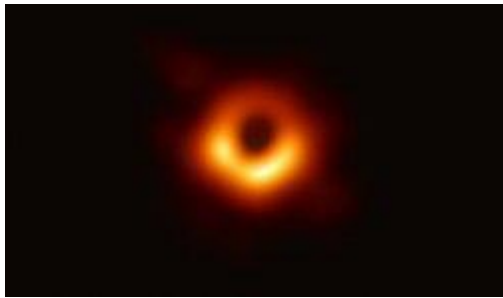
[ [edit](#) ]



Miller's planet orbiting Gargantua

To create the visual effects for the wormhole and a [rotating, supermassive black hole](#) (possessing an [ergosphere](#), as opposed to a non-rotating black hole), Thorne collaborated with Franklin and a team of 30 people at [Double Negative](#), providing pages of deeply sourced [theoretical equations](#) to the engineers, who then wrote new [CGI](#) rendering software based on these equations to create accurate simulations of the [gravitational lensing](#) caused by these phenomena. Some individual frames took up to 100 hours to render, totaling 800 [terabytes](#) of data. <sup>[6]</sup> Thorne described the accretion disk of the black hole as "anemic and at low temperature <sup>[61]</sup>—about the temperature of the surface of the sun," allowing it to emit appreciable light, but not enough [gamma radiation](#) and [X-rays](#) to threaten nearby astronauts and planets. <sup>[62]</sup> The resulting visual effects provided Thorne with new insight into the gravitational lensing and [accretion disks](#) surrounding black holes, resulting in the

publication of three [scientific papers](#). [63][64][65]



The first image of the event horizon of a black hole, obtained by the [Event Horizon Telescope](#) in 2019. The asymmetric brightness of the accretion disk is well visible here.

Nolan was initially concerned that a scientifically accurate depiction of a black hole would not be visually comprehensible to an audience, and would require the effects team to unrealistically alter its appearance. The visual representation of the black hole in the film does not account for the [Doppler effect](#) which, when added by the visual effects team, resulted in an asymmetrically lit black and blue-black hole, the purpose of which Nolan thought the audience would not understand. As a result, it was omitted in the finished product. [66] Nolan found the finished effect to be understandable, as long as he maintained consistent camera perspectives. [67]

As a reference, the asymmetric brightness of the accretion disk is very well visible in the first image [68] of the event horizon of a black hole obtained by the [Event Horizon Telescope](#) team in 2019. *Futura-Sciences* praised the correct depiction of the [Penrose process](#). [69]

According to [Space.com](#), the portrayal of what a wormhole would look like is scientifically correct. Rather than a two-dimensional hole in space, it is depicted as a sphere, showing a distorted view of the target galaxy. [70]

The teaser trailer for *Interstellar* debuted December 13, 2013, and featured clips related to [space exploration](#), accompanied by a voiceover by Matthew McConaughey's character, Cooper. [

71] The theatrical trailer debuted May 5, 2014, at the [Lockheed Martin](#) IMAX Theater in [Washington, D.C.](#), and was made available online later that month. For the week ending on May 19, it was the most-viewed film trailer, with over 19.5 million views on [YouTube](#). [72]

Christopher Nolan and McConaughey made their first appearances at [San Diego Comic-Con](#) in July 2014 to promote *Interstellar*. That same month, Paramount Pictures launched an interactive website, on which users uncovered a [star chart](#) related to the [Apollo 11](#) Moon landing. [73]

In October 2014, Paramount partnered with [Google](#) to promote *Interstellar* across multiple platforms. [74] The film's website was relaunched as a digital hub hosted on a Google domain, [75] which collected feedback from film audiences, and linked to a mobile app. [75] It featured a game in which players could build [Solar System](#) models and use a [flight simulator](#) for space travel. [76] The Paramount–Google partnership also included a virtual [time capsule](#) compiled with user-generated content, made available in 2015. [77] The initiative Google for Education used the film as a basis for promoting math and science lesson plans in schools. [74][78]

Paramount provided a [virtual reality](#) walkthrough of the *Endurance* spacecraft using [Oculus Rift](#) technology. It hosted the walkthrough sequentially in New York City, Houston, Los Angeles, and Washington, D.C., from October 6 through November 19, 2014. [79][80] The publisher [Running Press](#) released *Interstellar: Beyond Time and Space*, a book by [Mark Cotta Vaz](#) about the making of the film, on November 11. [81] [W. W. Norton & Company](#) released *The Science of Interstellar*, a book by Thorne; [82] [Titan Books](#) released the official novelization, written by [Greg Keyes](#); [83] and *Wired* magazine released a tie-in [online comic](#), *Absolute Zero*, written by Christopher Nolan and drawn by [Sean Gordon Murphy](#). The comic is a [prequel](#) to the film, with Mann as the protagonist. [84]

Before *Interstellar*'s public release, Paramount CEO [Brad Grey](#) hosted a private screening on October 19, 2014, at the AMC Lincoln Square IMAX theater in [Manhattan, New York](#).<sup>[85][86]</sup> Paramount then showed *Interstellar* to some of the industry's filmmakers and actors in a first-look screening at the [California Science Center](#) on October 22.<sup>[87]</sup> On the following day, the film was screened at the [TCL Chinese Theatre](#) in [Los Angeles](#), California for over 900 members of the [Screen Actors Guild](#).<sup>[88]</sup> The film premiered on October 26 at the TCL Chinese Theatre in Los Angeles,<sup>[89]</sup> and in Europe on October 29 at the [Odeon Leicester Square](#) in London.<sup>[90][91]</sup>

*Interstellar* was released early on November 4 in various [70 mm](#) IMAX film, 70 mm film and [35 mm](#) film theaters, and had a limited release in [North America](#) on November 5, with a wide release on November 7.<sup>[92]</sup> The film was released in Belgium, France, and Switzerland on November 5, the UK on November 7 and in additional territories in the following days.<sup>[93]</sup> For the limited North American release, *Interstellar* was projected from 70 mm and 35 mm film in 249 theaters that still supported those formats, including at least forty-one 70 mm IMAX theaters. A 70 mm IMAX projector was installed at the TCL Chinese Theatre in Los Angeles to display the format. The film's wide release expanded to theaters that showed it digitally.<sup>[94]</sup> Paramount Pictures distributed the film in North America, and Warner Bros. distributed it in the remaining territories.<sup>[29]</sup> The film was released in over 770 IMAX screens worldwide, which was the largest global release in IMAX cinemas,<sup>[95][96]</sup> until surpassed by [Universal Pictures](#)' *Furious 7* (2015) with 810 IMAX theaters.<sup>[97]</sup>

*Interstellar* was an exception to Paramount Pictures' goal to stop releasing films on [film stock](#) and to distribute them only in digital format.<sup>[98]</sup> According to Pamela McClintock of *The Hollywood Reporter*, the initiative to project *Interstellar* on film stock would help preserve an endangered format,<sup>[94]</sup> which was supported by Christopher

Nolan, [J. J. Abrams](#), [Quentin Tarantino](#), [Judd Apatow](#), [Paul Thomas Anderson](#), and other filmmakers.<sup>[99]</sup> McClintock reported that theatre owners saw this as "backward", as nearly all theatres in the US had been converted to digital projection.<sup>[100]</sup>

*Interstellar* was re-released in theaters on December 6, 2024, for its 10th anniversary, showing in 70 mm IMAX and digital formats.<sup>[101][102]</sup> At the weekend box office, the re-release grossed \$14 million worldwide, boosting the film's total box office figure to \$720 million globally.<sup>[103]</sup> With the re-release, the film also crossed the \$200 million box office threshold in the United States, and has gone on to be the highest-grossing IMAX re-release of all time, accumulating \$24.4 million at the worldwide box office, as of December 20, 2024.<sup>[104][105]</sup>

*Interstellar* was released on [home video](#) on March 31, 2015, in both the United Kingdom and United States.<sup>[106]</sup> It topped the home video sales chart for a total of two weeks.<sup>[107][108]</sup> It was reported that *Interstellar* was the most pirated film of 2015, with an estimated 46.7 million downloads on [BitTorrent](#).<sup>[109]</sup> It was released in the [Ultra HD Blu-ray](#) format on December 19, 2017.<sup>[110]</sup>

*Interstellar* grossed \$188 million in the US and Canada, and \$493 million in other countries, for a worldwide total of \$681 million on original release, against a production budget of \$165 million.<sup>[3]</sup> [Deadline Hollywood](#) calculated the net profit to be \$47 million, accounting for production budgets, marketing, talent participations, and other costs, with box office grosses, and ancillary revenues from home media, placing it 20th on their list of 2014's "Most Valuable Blockbusters".<sup>[111]</sup> It sold an estimated 22 million tickets domestically.<sup>[112]</sup>

The film set an IMAX opening record worldwide with \$20.5 million from 574 IMAX theaters, surpassing the \$17 million record held by *The Hunger Games: Catching Fire* (2013), and is the best opening for an IMAX 2D, non-sequel, and



November IMAX release. [\[113\]](#) It had a worldwide opening of \$133 million, which was the tenth-largest opening of 2014, [\[114\]](#) and became the [tenth-highest-grossing film of 2014](#). [\[115\]](#) *Interstellar* is the fourth film to gross over \$100 million worldwide from IMAX ticket sales. [\[116\]](#) [\[117\]](#) [\[118\]](#) It was released in the UK, Ireland and Malta on November 6, 2014, and debuted at number one earning £5.5 million (\$8.6 million) in its opening weekend, which was lower than the openings of *The Dark Knight Rises* (£14.4 million), *Gravity* (£6.2 million), and *Inception* (£5.9 million). [\[119\]](#) The film was released in 35 markets on the same day, including major markets like Germany, Russia, Australia, and Brazil earning \$8.7 million in total. [\[120\]](#) Through Sunday, it earned an opening weekend total of \$83 million from 11.1 million admissions from over 14,800 screens in 62 markets. [\[121\]](#) It earned \$7.3 million from 206 IMAX screens, at an average of 35,400 viewers per theater. [\[122\]](#) It went to number one in South Korea (\$14.4 million), [\[123\]](#) Russia (\$8.9 million), and France (\$5.3 million). Other strong openings occurred in Germany (\$4.6 million), India (\$4.3 million), Italy (\$3.7 million), Australia (\$3.7 million), Spain (\$2.7 million), Mexico (\$3.1 million), and Brazil (\$1.9 million). [\[124\]](#) *Interstellar* was released in China on November 12 and earned \$5.4 million on its opening day on Wednesday, which is Nolan's biggest opening in China after surpassing the \$4.61 million opening record of *The Dark Knight Rises*. [\[125\]](#) [\[126\]](#) It went on to earn \$41.7 million in its opening weekend, accounting for 55% of the market share. [\[127\]](#) [\[128\]](#) It is Nolan's biggest opening in China, Warner Bros.' biggest 2D opening, [\[129\]](#) and the studio's third-biggest opening of all time, behind 2014's *The Hobbit: The Battle of the Five Armies* (\$49.5 million) [\[130\]](#) and 2013's *Pacific Rim* (\$45 million). [\[131\]](#) [\[132\]](#) [\[needs update?\]](#)

It topped the box office outside North America for two consecutive weekends before being overtaken by [The Hunger Games: Mockingjay – Part 1](#)

(2014) in its third weekend. [\[129\]](#) Just 31 days after its release, the film became the [13th-most-successful film and 3rd-most-successful foreign film in South Korea](#) with 9.1 million admissions trailing only *Avatar* (13.3 million admissions), and 2013's *Frozen* (10.3 million admissions). [\[133\]](#) The film closed down its theatrical run in China on December 12, with total revenue of \$122.6 million. [\[134\]](#) [\[135\]](#) In total earnings, its largest markets outside North America and China were South Korea (\$73.4 million), the UK, Ireland and Malta (\$31.3 million), and Russia and the [Commonwealth of Independent States](#) (CIS) (\$19 million). [\[136\]](#) *Interstellar* and *Big Hero 6* opened the same weekend (November 7–9, 2014) in the US and Canada. Both were forecast to earn between \$55 million and \$60 million. [\[137\]](#) In North America, the film is the seventh-highest-grossing film to not hit No. 1, with a top rank of No. 2 on its opening weekend. [\[138\]](#) *Interstellar* had an early limited release in the US and Canada in selected theaters on November 4 at 8:00 pm, coinciding with the [2014 US midterm elections](#). [\[139\]](#) It topped the box office the following day, earning \$1.35 million from 249 theaters (42 of which were IMAX screens); IMAX accounted for 62% of its total gross. [\[140\]](#) Two hundred and forty of those theaters played in 35 mm, 70 mm, and IMAX 70 mm film formats. [\[141\]](#) It earned \$3.6 million from late-night shows for a previews total of \$4.9 million. [\[142\]](#) [\[143\]](#) [\[144\]](#) The film was [widely released](#) on November 7 and topped the box office on its opening day, earning \$17 million ahead of *Big Hero 6* (\$15.8 million). [\[145\]](#) On its opening weekend, the film earned \$47.5 million [\[b\]](#) from 3,561 theaters, debuting in second place after a neck-and-neck competition with [Disney](#)'s *Big Hero 6* (\$56.2 million). [\[147\]](#) IMAX comprised \$13.2 million (28%) of its opening weekend gross, [\[147\]](#) while other premium large-format screens comprised \$5.3 million (10.5%) of the gross. [\[148\]](#) [\[149\]](#) In its second weekend, the film fell to No. 3 behind *Big Hero 6* and newcomer *Dumb and*

[Dumber To](#) (2014), and dropped 39% earning \$29 million for a two-weekend total of \$98 million. [\[150\]](#) [\[151\]](#) It earned \$7.4 million from IMAX theaters from 368 screens in its second weekend. [\[152\]](#) [\[153\]](#) In its third week, the film earned \$15 million and remained at No. 3, below newcomer *The Hunger Games: Mockingjay – Part 1* and *Big Hero 6*. [\[154\]](#)

On [review aggregator Rotten Tomatoes](#), 73% of 378 critic reviews are positive, with an average of 7.1/10. The site's critics consensus reads, "*Interstellar* represents more of the thrilling, thought-provoking, and visually resplendent filmmaking moviegoers have come to expect from writer-director Christopher Nolan, even if its intellectual reach somewhat exceeds its grasp." [\[155\]](#) [Metacritic](#) assigned the film a score of 74 out of 100 based on 46 critics, indicating "generally favorable" reviews. [\[156\]](#) Audiences polled by [CinemaScore](#) gave it an average grade of "B+" on an A+ to F scale. [\[157\]](#)

Scott Foundas, chief film critic at [Variety](#), said that *Interstellar* is "as visually and conceptually audacious as anything Nolan has yet done" and considered the film "more personal" than Nolan's previous films. [\[158\]](#) Claudia Puig of [USA Today](#) praised the visual spectacle and powerful themes, while criticizing the "dull" dialogue and "tedious patches inside the space vessel". [\[159\]](#) [David Stratton](#) of [At the Movies](#) rated the film four-and-a-half stars out of five, commending its ambition, effects, and 70 mm IMAX presentation, though criticizing the sound for "being so loud" as to make some of the dialogue "inaudible". Conversely, co-host [Margaret Pomeranz](#) rated the film three out of five, as she felt the human drama got lost among the film's scientific concepts. [\[160\]](#) Henry Barnes of [The Guardian](#) scored the film three out of five stars, calling it "a glorious spectacle, but a slight drama, with few characters and too-rare flashes of humour". [\[161\]](#) [James Berardinelli](#) called *Interstellar* "an amazing achievement" and "simultaneously a big-budget science fiction endeavor and a very simple tale of love and sacrifice. It is by turns edgy, breathtaking, hopeful,

and heartbreaking." [\[162\]](#) He named it the best film of 2014, [\[163\]](#) and the second-best movie of the decade, deeming it a "real science fiction rather than the crowd-pleasing, watered-down version Hollywood typically offers". [\[164\]](#)

"It's been a while since somebody has come out with such a big vision to things ... Even the elements, the fact that dust is everywhere, and they're living in this dust bowl that is just completely enveloping this area of the world. That's almost something you expect from [Tarkovsky](#) or [Malick](#), not a science fiction adventure movie." [\[165\]](#)

Oliver Gettell of the [Los Angeles Times](#) reported that "film critics largely agree that *Interstellar* is an entertaining, emotional, and thought-provoking sci-fi saga, even if it can also be clunky and sentimental at times." [\[166\]](#) James Dyer of [Empire](#) awarded the film a full five stars, describing it as "brainy, barmy, and beautiful to behold ... a mind-bending opera of space and time with a soul wrapped up in all the science." [\[167\]](#) Dave Calhoun of [Time Out London](#) also granted the film a maximum score of five stars, stating that it is "a bold, beautiful cosmic adventure story with a touch of the surreal and the dreamlike". [\[168\]](#) [Richard Roeper](#) of [Chicago Sun-Times](#) awarded the film a full four stars and wrote, "This is one of the most beautiful films I have ever seen—in terms of its visuals, and its overriding message about the powerful forces of the one thing we all know but can't measure in scientific terms. Love." [\[169\]](#)

Describing Nolan as a "merchant of awe", Tim Robey of [The Telegraph](#) thought that *Interstellar* was "agonisingly" close to a masterpiece, highlighting the conceptual boldness and "deep-digging intelligence" of the film. [\[170\]](#) [Todd McCarthy](#) of [The Hollywood Reporter](#) wrote, "This grandly conceived and executed epic tries to give equal weight to intimate human emotions and speculation about the cosmos, with mixed results, but is never less than engrossing, and sometimes

more than that." <sup>[171]</sup> In his review for the [Associated Press](#), Jake Coyle praised the film for its "big-screen grandeur", while finding some of the dialogue "clunky". He described it further as "an absurd endeavor" and "one of the most sublime movies of the decade". <sup>[172]</sup> Scott Mendelson of [Forbes](#) listed *Interstellar* as one of the most disappointing films of 2014, stating that the film "has a lack of flow, loss of momentum following the climax, clumsy sound mixing", and "thin characters" despite seeing the film twice in order to "give it a second chance". He wrote that *Interstellar* "ends up as a stripped-down and somewhat muted variation on any number of 'go into space to save the world' movies." <sup>[173]</sup> [Matt Zoller Seitz](#) of [RogerEbert.com](#) gave the film three-and-a-half out of four stars, saying that despite his usual quibbles regarding Nolan's excessive dialogue and its lack of a sense of composition, "[*Interstellar* ] is still an impressive, at times astonishing movie that overwhelmed me to the point where my usual objections to Nolan's work melted away ... At times, the movie's one-stop-shopping storytelling evokes the tough-tender spirit of a [John Ford](#) picture ... a movie that would rather try to be eight or nine things than just one." <sup>[174]</sup>

[New York Times](#) columnist [David Brooks](#) concludes that *Interstellar* explores the relationships among "science and faith and science and the humanities" and "illustrates the real symbiosis between these realms". <sup>[175]</sup> Mark Steyn commented on the technological future and the focus on the father-daughter relationship. <sup>[176]</sup> [Wai Chee Dimock](#), in the [Los Angeles Review of Books](#), wrote that Nolan's films are "rotatable at 90, 180, and 360 degrees," and that "although there is considerable magical thinking here, making it almost an anti-sci-fi film, holding out hope that the end of the planet is not the end of everything, it reverses itself, however, when that magic falls short when the poetic license is naked and plain for all to see". <sup>[177]</sup> Author [George R. R. Martin](#) called *Interstellar* "the most ambitious and challenging [science fiction](#) film since [Kubrick](#)'s *2001*." <sup>[178]</sup> In 2020, [Empire](#) magazine ranked

it as one of the best films of the 21st century. <sup>[179]</sup>

At the [87th Academy Awards](#), *Interstellar* received nominations for [Best Original Score](#), [Best Production Design](#), [Best Sound Editing](#), and [Best Sound Mixing](#), and won [Best Visual Effects](#). <sup>[180]</sup>

- [Black holes in fiction](#)
- [Blanet](#) – planet orbiting a black hole
- [Causal loop](#)
- [Interstellar travel](#)
- [List of American films of 2014](#)
- [List of British films of 2014](#)
- [List of films featuring drones](#)
- [List of films featuring space stations](#)
- [List of time travel works of fiction](#)
- [Starship](#)
- [Wormholes in fiction](#)

1. <sup>^</sup> Referred to only as "Cooper" or "Coop" in the film
2. <sup>^</sup> In total the film earned \$2.2 million from the two late-night showings which would bring its opening weekend gross to \$49.7 million. <sup>[146]</sup>
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4. <sup>^</sup> "*Anne Hathaway says she lost roles because of her haters*". [The A.V. Club](#). March 25, 2024. Retrieved June 11, 2024.
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