Brief History of Special Effects in Film
Early years, 1890s.


- Earlier, 1890, W.K.L. Dickson, assistant to Edison, developed Kinetograph.

- One of these films included the world’s first known special effect shot, The Execution of Mary, Queen of Scots, by Alfred Clarke, 1895.
Georges Melies

- Father of Special Effects

- Son of boot-maker, purchased Theatre Robert-Houdin in Paris, produced stage illusions and such as Magic Lantern shows.

- Witnessed one of first Lumiere shows, and within three months purchased a device for use with Edison’s Kinetoscope, and developed his own prototype camera.

- Produced one-shot films, moving versions of earlier shows, accidentally discovering “stop-action” for himself.

- Soon using stop-action, double exposure, fast and slow motion, dissolves, and perspective tricks.
Cinderella, 1899, stop-action turns pumpkin into stage coach and rags into a gown.

Indian Rubber Head, 1902, uses split-screen by masking areas of film and exposing again, “exploding” his own head.

A Trip to the Moon, 1902, based on Verne and Wells -- 21 minute epic, trompe l’oeil, perspective shifts, and other tricks to tell story of Victorian explorers visiting the moon.

Ten-year run as best-known filmmaker, but surpassed by others such as D.W. Griffith and bankrupted by WW I.
Other Effects Pioneers, early 1900s.

- Robert W. Paul -- copied Edison’s projector and built his own camera and projection system to sell in England. Produced films to sell systems, such as *The Haunted Curiosity Shop* (1901) and *The ? Motorist* (1906). Few survived, since he sold his studio and burned his films.

- Englishman G.A. Smith constructed his own movie camera, patenting double-exposure in England, using the method to make a ghost for *The Corsican Brothers* (1909). *Airship Destroyer* (1919) used a realistic model of London to create an air attack on the city.

- 1898, Albert Smith and J. Stuart Blackton, formed Vitagraph, and filmed *The Battle of Santiago Bay* using paintings and photographs. In *The Windsor Hotel Fire* (1899), miniatures fell from cardboard buildings with squirt guns simulating the fire department’s efforts.

- Other studios: Biograph, Lubin, Selig and Edison -- mimicked recent events such as the 1906 San Francisco earthquake.
Edwin S. Porter

The Great Train Robbery (1903)

- double exposure for train in window and passing landscape.

- three frames tinted red to simulate gun being fired, later used in 1945 by Hitchcock for Spellbound.

Used tricks to further plot rather than for spectacle.

Left Edison in 1909 to head Rex. Moved into research and development but devastated by 1929 market crash.
1910s

- American Industry in SoCal.
- David Wark Griffith joined Biograph in 1907 and began to revolutionize film grammar with editing, camera movement, shot composition, and lighting.
- Dissolves, hand-cranking (fast slow v 16 fps), and iris effects in-camera.
- 1912 Bell & Howell facilitated split-screens and double exposures with fixed registration pin and accurate frame counter.
- 1916 - Frank Williams invents traveling matte system, later refined as blue-screen.
- Mark Sennett -- Keystone Kops. Gags requiring effects -- rubber bricks, collapsing telegraph poles, fake houses, car crashes, special patrol wagon. Chaplin, Lilloyd, and even Capra worked here at one time.
• “Special Effect” received first screen credit in 1926 Fox picture *What Price Glory?*

• Continued use of traveling mattes, placing actors filmed in studio placed within settings of a different time and place.

• Use of miniatures such as in *The Crowd* (1928) and *Just Imagine* (1930).

• Dominance of German filmmakers in effects work such as
  - Paul Wegener: *Living Buddhas* (1923)
  - Fritz Lang: *Die Niebelungen* (1924) 60 ft dragon, Shuftan process combining full-size sets with miniatures using mirrors. *Metropolis* (1926) -- models, animation, matte painting, rear projection, and full-scale mechanical effects. US: *By Rocket to the Moon*

• America tried to compete with opulent sets such as used in *Thief of Bagdad* (1924). Wires for the flying carpet.

Linwood Dunn, RKO, optical printer.
1930s


- Merian C. Cooper and animator Willis O’Brien -- *King Kong* (1933) -- stop-motion, miniatures, rear-projection, and optical compositing using live actors, puppets, and miniatures. 55 weeks for stop-motion.

- Departments such as at MGM: special effects -- rear projection, miniatures, and physical effects. Optical dept -- matte paintings and optical printing.

- 1939 -- first Academy Award in Special Effects given to “The Rains Came” featuring a tremendous flood, besting *Gone with the Wind* and *Wizard of Oz*. 
1940s

- *Citizen Kane* (1941) -- matte paintings, miniatures, and advanced optical printing (not even nominated).

- Color film required many modifications to learned techniques.

- *Gone With the Wind* (1939) first Technicolor matte painting.

- Hitchcock less often credited as important sfx director began US career with *Rebecca* (1940).

- Willis O’Brien directed *Mighty Joe Young* with assistance by young Ray Harryhausen who went on to create more than 20 films such as *Jason and the Argonauts* and *Sinbad and the Eye of the Tiger*.

Color traveling mattes first used in the 1940 film *The Thief of Baghdad*. 
1950s

- Movie attendance drops as television grows. Effects-laden productions and larger-than-life formats such as CinemaScope, VistaVision, Cinerama, and 3-D.

- **The Robe** 1953, first CinemaScope film.

- **Destination Moon, The War of the Worlds** (1953), George Pal.

- **The 7th Voyage of Sinbad** (1959) -- Harryhausen used perspective, splitscreen, improportional props, mattes, and stop-motion.

- Cecil B. DeMille’s **The Ten Commandments** -- blue screen, miniatures, pyrotechnics, 600 extras, matte paintings, 32-foot high dam.

- Paramount invents ‘repeater’, early mechanical motion control.
• Extravagant budgets, sets, use of extras, costume, etc. in large and more violent productions to lure more audience after thousands of theater-closures.

• Ivan Sutherland invents Sketchpad in 1961.

• Cleopatra (1963). $44 million (approx $300 million today). Roman forum larger than original. Full-scale barge with gilded stern.

• Fantastic Voyage (1966) enormous sets and wire-suspended actors.

• Planet of the Apes (1968).

• Kubrick’s 2001: A Space Odyssey (1968), early motion control, slit-scan technique for Stargate corridor, miniatures, front projection, etc.

Effects departments shut down, except for Disney -- The Nutty Professor and Mary Poppins.
1970s


- Simultaneous release dates.

- ‘Movie brats’ -- Coppola, Spielburg, Lucas.


- Lucas’s technicians built first computer-controlled camera (motion-control) invented by FX supervisor John Dykstra and used through space battles. Also optical effects, matte paintings, models, make-up, animation, and pyrotechnics.

- Superman (1978), Star Trek: The Motion Picture (1979), The Black Hole (1979), and Alien (1979).
• Continue trend, trying to mimic success of *Star Wars*.


• *Return of Jedi* (1983) has optical compositing with over 300 separate film elements for space battle shot.

• *Young Sherlock Homes* (1985) first CG character -- medieval knight from stained glass.

• *TRON* (1982) and aftermath.


• ILM disbanded after *Star Wars* but permanently rebuilt for *Empire*.

• Effects houses bid for shots based on script breakdown.
1990s

- Film scanning and recording becomes fast and reliable. Computers have more power.

- Terminator 2 (1991) -- 5 1/2 min for 100 CGI elements. After 60+ years of optical printing, all effects are digitally composited.

- Jurassic Park (1993) -- first CG characters rather than stop or go motion.

- Toy Story (1995) first entirely CG feature. 1000 GB of data with 800,000 machine hours of rendering.

- Titanic (1997) -- over 450 effects shots by Digital Domain and 16 other companies.