Stellar Evolution Card Set Description and Links

1. Tycho's SNR (NASA/Chandra X-ray image)
   Type Ia supernova remnant – thermonuclear explosion of a white dwarf
   http://chandra.harvard.edu/photo/2011/tycho2/

2. Protostar formation (NASA/JPL/Caltech/Spitzer/R. Hurt illustration)
   A young star/protostar forming within a cloud of gas and dust
   http://www.spitzer.caltech.edu/images/1852-ssc2007-14d-Planet-Forming-Disk-Around-a-Baby-Star

3. The Crab Nebula (NASA/Chandra X-ray/Hubble optical/Spitzer IR composite image)
   A type II supernova remnant with a millisecond pulsar stellar core
   http://chandra.harvard.edu/photo/2009/crab/

4. Cygnus X-1 (NASA/Chandra/M Weiss illustration)
   A stellar mass black hole in an X-ray binary system with a main sequence companion star
   http://chandra.harvard.edu/photo/2011/cygx1/

5. White dwarf with red giant companion star (ESO/M. Kornmesser illustration/video)
   A white dwarf accreting material from a red giant companion could result in a Type Ia supernova
   http://www.eso.org/public/videos/eso0943b/

6. Eight Burst Nebula (NASA/Hubble optical image)
   A planetary nebula with a white dwarf and companion star binary system in its center
   http://apod.nasa.gov/apod/ap150607.html

7. The Carina Nebula star-formation complex (NASA/Hubble optical image)
   A massive and active star formation region with newly forming protostars and stars
   http://www.spacetelescope.org/images/heic0707b/

8. NGC 6826 (Chandra X-ray/Hubble optical composite image)
   A planetary nebula with a white dwarf stellar core in its center
   http://chandra.harvard.edu/photo/2012/pne/

9. A red giant star with a planet (NASA illustration/animation)
   An expanding red giant star approaching a nearby planet
   http://science.nasa.gov/science-news/science-at-nasa/2012/25oct_friedplanets/

10. The Sirius A & Sirius B binary system (McDonald Observatory optical image)
    Sirius B is the optically dim white dwarf companion of the massive star Sirius A
    http://www.solstation.com/stars/sirius2.htm

11. Protoplanetary disk (NASA/Hubble IR image)
    A protoplanetary disk embedded in gas and dust in the Taurus Molecular Cloud system https://online.science.psu.edu/astro140_fawd001/node/11774

12. SNR Puppis A (NASA/Chandra X-ray/ESO/XMM Newton X-ray image)
    A Type II supernova remnant expanding into a knotty interstellar medium
    http://chandra.harvard.edu/photo/2014/puppisa/

13. M33 X-7 (NASA/Chandra X-ray observation/illustration)
    A stellar mass black hole orbiting a main sequence companion star in the M33 galaxy http://chandra.harvard.edu/photo/2007/m33x7/

14. SNR G292.0+1.8 (NASA/Chandra X-ray image)
    A Type II supernova remnant with a pulsar wind nebula in the center
    http://chandra.harvard.edu/photo/2007/g292/

15. The Vela pulsar (NASA/Chandra X-ray image/video)
    A rapidly rotating pulsar stellar core formed from a Type II supernova event http://chandra.harvard.edu/press/13_releases/press_010713.html

16. Two orbiting white dwarfs (NASA/Chandra observation/illustration/video)
    A binary system composed of two white dwarfs that will eventually coalesce
    http://chandra.harvard.edu/photo/2013/amcvn/

17. The Trifid Nebula (Daniel Lopez, Observatorio del Teide)
    A star formation and emission nebula region with opaque molecular clouds
    http://apod.nasa.gov/apod/ap080630.html

18. Betelgeuse (CFA/STScI/NASA)
    A red supergiant star that will collapse into a Type II supernova remnant and stellar core
    http://apod.nasa.gov/apod/ap990605.html

19. The Pleiades (David Malin, Anglo-Australian Observatory (AAO))
    An open cluster of young massive hot stars
    http://apod.nasa.gov/apod/ap021201.html

20. SNR 0509-67.5 (NASA/Chandra X-ray/Hubble optical composite image)
    A Type Ia supernova event - the thermonuclear destruction of a white dwarf
    http://chandra.harvard.edu/photo/2010/snr0509/

21. The Sun (NASA/SOHO extreme UV image)
    The solar photosphere showing an extremely active Sun and several eruptions
    http://sohowww.nascom.nasa.gov/gallery/images/eit304prom.html

22. DEM L71 (NASA/Chandra X-ray image)
    A Type Ia supernova remnant with no stellar core in the Large Magellanic Cloud galaxy
    http://chandra.harvard.edu/photo/2003/deml71/

23. NGC 2440 (NASA/ESA/AURA/STScI Hubble optical image)
    A young extremely hot white dwarf embedded within its planetary nebula
    https://www.spacetelescope.org/images/opo9935e/

24. Eta Carinae (NASA/Chandra X-ray/Hubble optical composite image)
    A supermassive giant star rapidly approaching a hypernova event
    http://chandra.harvard.edu/photo/2007/etacar/

25. Horsehead Nebula (Jean-Charles Cuillandre, Canadian-France-Hawaii Telescope (CFHT))
    Cold molecular cloud with emission and reflection nebulas in Orion star formation region
    http://www.nasa.gov/multimedia/imagegallery/image_feature_89.html

26. Protoplanetary disk (NASA/JPL-Caltech illustration)
    A protoplanetary disk with magnetic field lines and a forming protostar
    http://www.nasa.gov/image-feature/light-echoes-used-to-study-protoplanetary-disks

27. M13 globular cluster (Sloan Digital Sky Survey (SDSS) optical image)
    A compact cluster of ~300,000 stars located in the halo of the Milky Way Galaxy
    http://apod.nasa.gov/apod/ap100527.html & http://www.sdss.org/science/

28. CoRoT-2a & 2b (NASA/Chandra X-ray Image)
    A hot Jupiter exoplanet orbiting its parent star
    http://chandra.harvard.edu/photo/2011/corot/

29. Debris disk (Gemini Observatory/AURA artwork by Lynette Cook)
    A circumstellar disk surrounding a protostar with potential future planets
    https://en.wikipedia.org/wiki/Debris_disk

30. Planetary nebula PK 164 + 31.1 (Descubre Foundation, CAHA, OAUV, DSA et als)
    A planetary nebula with a central white dwarf stellar core
    http://apod.nasa.gov/apod/ap121030.html

31. White dwarf and red giant (NASA/SWIFT illustration)
    A white dwarf & red giant binary system which could lead to a Type Ia supernova event
    http://www.nasa.gov/mission_pages/swift/bursts/supernova-narrowing_prt.htm

32. Sun as a red giant (Ron Miller, artist)
    An illustration of the Sun in the red giant stage as it expands to engulf planet Earth
    http://www.sciencemag.org/news/2014/01/earth-wont-die-soon-thought &
    http://io9.gizmodo.com/5871387/what-will-happen-when-the-sun-dies

33. Orion constellation (John Gauvreau, astrophotography)
    The Orion asterism includes a red supergiant and a star formation region (M42)
    http://apod.nasa.gov/apod/ap081015.html

34. M78 (Ian Sharp, Astrophotography)
    Dark molecular clouds and reflection nebulas in the Orion Molecular Cloud Complex
    http://apod.nasa.gov/apod/ap140326.html

35. V 1647 Ori (NASA/Chandra X-ray observation/ illustration)
    A young and violent protostar in Orion transitioning to a young star
    http://chandra.harvard.edu/photo/2012/v1647/

36. M16 Eagle Nebula (NASA/Hubble optical image)
    UV radiation from star formation is eroding surrounding pillars of gas and dust
    http://apod.nasa.gov/apod/ap061022.html

37. Antares (David Malin AAO, AATB, UKS Telescope)
    A red supergiant star in Scorpius; part of the rho Ophiuchi star formation complex
    http://apod.nasa.gov/apod/ap980726.html

38. SNR Cassiopeia A (Cas A), (NASA/Chandra X-ray image/video)
    A type II supernova remnant with a neutron star stellar core
    http://chandra.harvard.edu/photo/2009/casa/

39. White dwarf and red giant (NASA/SWIFT illustration)
    A white dwarf & red giant binary system which could lead to a Type Ia supernova event
    http://www.nasa.gov/mission_pages/swift/bursts/supernova-narrowing_prt.htm

40. The Sirius A & Sirius B binary system (NASA/Chandra X-ray image)
    Sirius B is the X-ray bright white dwarf companion of the massive star Sirius A
    http://chandra.harvard.edu/photo/2000/0065/

41. Cat's Eye Nebula (NASA/Chandra X-ray/Hubble optical composite image)
    Planetary nebula NGC 6543 with a white dwarf stellar core
    http://chandra.harvard.edu/photo/2008/catseye/

42. Omicron Ceti (Mira), (NASA/Chandra X-ray image)
    Mira is a pulsating red giant variable star with a white dwarf companion
    http://chandra.harvard.edu/photo/2005/mira/

43. Magnetar (Dr. Robert Mallozzi/Univ of Alabama/MSFC illustration)
    A neutron star with an extreme magnetic field
    http://science.nasa.gov/science-news/science-at-nasa/1998/ast20may98_1/

44. Two white dwarfs in a binary system (NASA/SWIFT illustration)
    Will coalesce into a more massive white dwarf, a neutron star or a Type Ia supernova
    http://www.nasa.gov/mission_pages/swift/bursts/supernova-narrowing_prt.htm

45. Rho Ophiuchi region (Gabor Toth Astrophotography)
    A massive star formation complex that includes Antares & and the globular cluster M4
    http://astro.i-net.hu/node/81

46. Pulsar light curve (ESO)
    The Crab Nebula (M1) stellar core millisecond pulsar light curve
    https://www.eso.org/public/images/eso9948i/

47. Delta Cephei light curve (AAVSO plotted observations)
    Delta Cep is a Cepheid pulsating variable star transitioning from the main sequence
    http://chandra.harvard.edu/edu/formal/variable_stars/HR_student.html

48. X-ray spectrum (NASA/Chandra X-ray)
    The Cas A Type II supernova remnant X-Ray spectrum
    http://chandra.harvard.edu/edu/formal/snr/bg5.html

49. Semiregular light curve (AAVSO plotted observations)
    Variability of a massive star transitioning from the main sequence to the supergiant branch of the H-R diagram
    http://chandra.harvard.edu/edu/formal/variable_stars/HR_student.html

50. SN 1998bu light curve (Caltec plotted light curve)
    This is a typical Type Ia light curve
    http://messier.seds.org/more/m096_sn98bu.html

51. Omicron Ceti (Mira) light curve (AAVSO plotted observations)
    A pulsating red giant variable star transitioning from the main sequence to the red giant branch of the H-R diagram
    http://chandra.harvard.edu/edu/formal/variable_stars/HR_student.html

52. RR Lyrae light curve (AAVSO plotted observations)
    A pulsating stage for older population II stars on the horizontal branch of the H-R diagram
    http://chandra.harvard.edu/edu/formal/variable_stars/HR_student.html

53. Protostar light curve (ESO)
    Light curve for a typical T Tauri protostar stage of a Sun-sized star
    https://en.wikipedia.org/wiki/T_Tauri_star

54. Hertzsprung-Russell (H-R) diagram showing the path of a solar mass star evolving from the main sequence through the Mira instability strip (Mira variable star) to the red giant branch. http://chandra.harvard.edu/edu/formal/stellar_ev/story/index3.html
    http://chandra.harvard.edu/edu/formal/stellar_ev/story/index4.html

55. Hertzsprung-Russell (H-R) diagram showing the path of a massive star evolving from the main sequence through the Cepheid instability strip (Cepheid variable star) to the red supergiant branch. http://chandra.harvard.edu/edu/formal/stellar_ev/story/index3.html
    http://chandra.harvard.edu/edu/formal/stellar_ev/story/index4.html

56. Hertzsprung-Russell (H-R) diagram showing the path of a supermassive star evolving from the main sequence through a semiregular variable star region to the red supergiant branch. http://chandra.harvard.edu/edu/formal/stellar_ev/story/index3.html
    http://chandra.harvard.edu/edu/formal/stellar_ev/story/index4.html

57. Hertzsprung-Russell (H-R) diagram showing the path of a star evolving along horizontal branch (follows the red giant stage) through an RR Lyrae variable star instability region.
    http://chandra.harvard.edu/edu/formal/stellar_ev/story/index3.html

58. Hertzsprung-Russell (H-R) diagram showing the path of a solar mass protostar dropping onto the main sequence (called a Zero Age Main Sequence (ZAMS) star) when hydrogen to helium fusion
    stabilizes. http://chandra.harvard.edu/edu/formal/stellar_ev/story/index3.html
    http://chandra.harvard.edu/edu/formal/stellar_ev/story/index4.html

59. An illustration that summarizes the various stages of stellar evolution for different mass stars from formation to final end products. (NASA/Chandra
    illustration) http://chandra.harvard.edu/edu/formal/stellar_ev/