PA State Science Olympiad 2011 — Astronomy C Division — KEY

1. MAssive Cluster Survey	26. Image 6
2. Chandra ACIS	27. Image 15
3. X-ray emission from hot gas	28. Image 2
4. Image 10	T7 29. Image 8
5. H2356-309	30. Image 16
6. WHIM warm-hot intergalactic medium	31. NGC 1260
7. Sculptor Wall	32. Perseus
8. VLBI very long baseline interferometry	T15 33. Image 3 or Image 14
9. Image 15	34. Quark star
10. NGC 5128	35. PGC 42510
11. Galactic cannibalism, remains of spiral	T2 36. Cepheid variables
12. X-Ray	37. Cen 30 in Centaurus Cluster
13. NGC 7319	38. M77
T6 14. Mrk 205	39. Weak broad emission lines
15. Halton Arp	40. Hidden Seyfert 1
16. Image 1	41. flux ratio [N II] λ6583/Hα λ6563
17. Arp 243	T3 42. BPT plot (Baldwin Phillips Terlevich)
18. Neutral Hydrogen absorption	43. HII regions
19. Image 13	44. LINER galaxies
20. mass density	45. Seyfert II or NLRG
T10 21. dark matter	46. -23
22. Image 11	T11 47. 3.01E6 years
23. Image 6	48. -24.3
24. ULIRG	49. magnetohydrodynamics
25. Vorontsov-Velyaminov interacting galaxies	50. 5.07E39 Watts

School #	School Name	SCORE
	Participants	

51. BL Lac

52. X-shaped radio galaxy

T1 53. Spin flip due to black hole merger

54. C

55. L

56. B

57. I

58. F

59. cD

60. George Abell

61. BLRG

62. BL Lac

63. LINER

64. Seyfert II

65. Normal galaxy

66. Quasar

T8 67. 13455 km/s

68. 1590 km/s

69. 192 Mpc

70. 2.35 Mpc

71. 1.37E15 solar masses

72. UV

T12 73. 1.34

74. Lyman-α forest

T5 75. 350 km/s

76. narrow

77. bulk motion of NLR clouds

78. 4c - 5c

T9 79. superluminal motion

80. near speed of light, small angle to line of sight

81. electrons and ion plasma

82. NLRG

83. BLR broad emission lines

84. relativistic beaming/boosting

85. 75 km/s

86. 3.33 or 0.30

87. 17.7 solar masses

88. faint halo, stellar spectrum, host galaxy

T13 89. 10^{-26} W/m^{2}Hz

90. ergosphere

91. Toomre sequence

92. big blue bump

93. reverberation mapping

T14 94. microquasar

95. Stromgren depth/sphere/radius

96. Lyman edge/limit/discontinuity 912 A

97. Gunn-Peterson test

98. Eddington limit

T4 99. Dynamical friction

100. Blandford-Znajek process

Bonus **Sir Arthur Eddington**