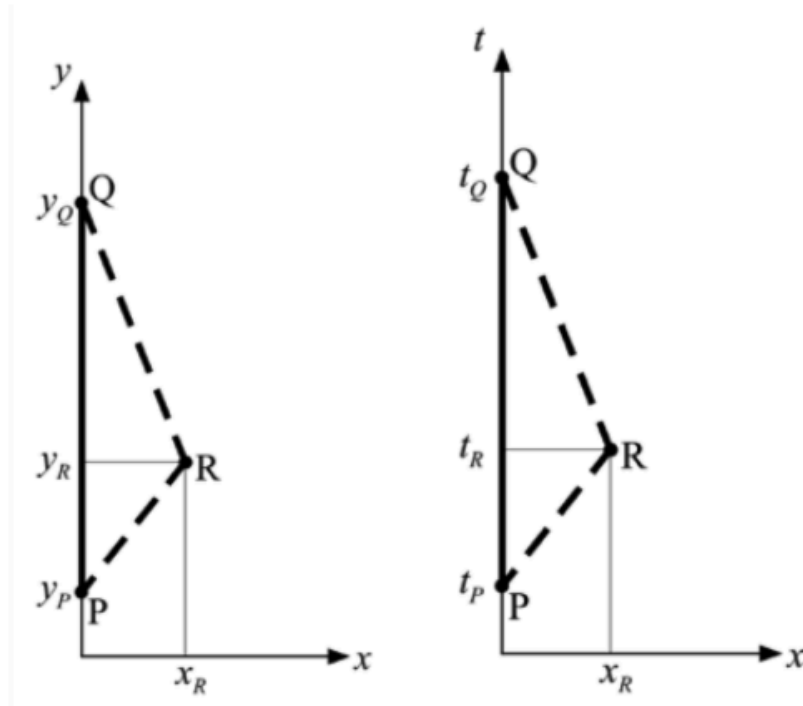


**Erratum for Chapter 2, Ch02BridgeSRtoGR170511v1.pdf:**

The following error correction is for those who use the *Safari* browser. This browser fails to show Figure 9 in Chapter 2, which is reproduced below.



**FIGURE 9** Left panel: Euclidean plane showing straight line PQ and broken line PRQ. Right panel: Spacetime diagram showing straight worldline PQ and broken worldline PRQ.

This is the only error that the Safari browser makes for the entire book.

The Firefox browser correctly shows Figure 9 in Chapter 2 and all of every other chapter.

We ask users of other browsers to let us know if they make errors of reproduction of the second edition of Exploring Black Holes.

**Errata from Chapter 12 to Chapter 20:**

CHAPTER	WHERE	CHANGE FROM	CHANGE TO
Ch12DivingPanoramas190403v1.pdf	p. 12-3, Line 73	see the to see	see
Ch12DivingPanoramas190403v1.pdf	p. 12-8, Line 154	Figure 3 above an	Figure 3 above and
Ch12DivingPanoramas190403v1.pdf	p. 12-12, Sample Problems 1, part C	SOLUTION: Begin with Figure 10	SOLUTION: Begin with Figure 8
Ch12DivingPanoramas190403v1.pdf	p. 12-12, Sample Problems 1, part C	These intersections correspond to $\theta_{\text{rain}} \approx \pm 110^\circ$ . These angles are greater than $\pm 90^\circ$ , so the rain observer looks somewhat behind her	These intersections correspond to $\theta_{\text{rain}} \approx \pm 35^\circ$ . These angles are smaller than $\pm 90^\circ$ , so the rain observer looks in front of her
Ch12DivingPanoramas190403v1.pdf	p. 12-14, Line 344	becomes $360^\circ - \cos\theta$	becomes $\cos(360^\circ - \theta)$
Ch12DivingPanoramas190403v1.pdf	p. 12-14, Line 345-346	aberration equation (54) in exercise 18 of Chapter 1	aberration equation (56) in exercise 22 of Chapter 1
Ch13GravitationalMirages160510v1.pdf	p. 13-8, Line 187	equation (40) of Section 11.6	equation (38) of Section 11.7
Ch13GravitationalMirages160510v1.pdf	p. 13-8, Line 191	equation (40) of Section 11.6	equation (38) of Section 11.7
Ch13GravitationalMirages160510v1.pdf	p. 13-8, Line 198	equation (27) in Section 11.4 to convert	equation (29) in Section 11.5 to convert

Ch13GravitationalMirages160510v1.pdf	p. 13-10, Box 1, left column	From (11) plus equation (27) in Section 11.4	From (11) plus equation (29) in Section 11.5
Ch14ExpandUniverse170331v1.pdf	p. 14-0, Line 5	Roberson-Walker	Robertson-Walker
Ch14ExpandUniverse170331v1.pdf	p. 14-5, Line 124	a scale factor in curved spacetime. Euclid does not describe curved spacetime,	a scale factor in curved space. Euclid does not describe curved space,
Ch14ExpandUniverse170331v1.pdf	p. 14-13, Box 4, left column	a galaxy formed at $t_{\text{emit}} = 0.7$ billion years ago?	a galaxy formed at $t_{\text{emit}} = 0.7$ billion years?
Ch15Cosmology170510v1.pdf	p. 15-11, Line 370	In Query 9 you showed	In Query 2 you showed
Ch15Cosmology170510v1.pdf	p. 15-23, Query 10, part D	From Figure 1, show that Einstein's model is unstable	From Figure 2, show that Einstein's model is unstable
Ch15Cosmology170510v1.pdf	p. 15-31, equation (54)	$- \int_{t_0}^t \frac{dt'}{a(t')}$	$- \int_{t_0}^t \frac{dt'}{a(t')}$
Ch16GravWaves171018v1.pdf	p. 16-3, Line 93	to describe this waves	to describe these waves
Ch16GravWaves171018v1.pdf	p. 16-5, Line 135	is about $10^{-21} \times 100^{1/2} = 10^{-23}$	is about $10^{-23} \times 100^{1/2} \approx 10^{-22}$
Ch16GravWaves171018v1.pdf	p. 16-5, Line 137	$10^{-21} \times 4 \times 10^3 = 4 \times 10^{-18}$ meters	$10^{-22} \times 4 \times 10^3 = 4 \times 10^{-19}$ meters
Ch16GravWaves171018v1.pdf	p. 16-8, Line 240	decreases as the inverse $r$ -separation	decreases as the inverse square of the $r$ -separation

Ch16GravWaves171018v1.pdf	p. 16-9, Lines 268-269	measures the changing interference of light waves round-trip <i>time delays</i> sent down the two legs of the detector.	measures the changing interference of light waves due to the different round-trip <i>time delays</i> for light beams sent down the two legs of the detector.
Ch16GravWaves171018v1.pdf	p. 16-9, Line 272	detector along	detector is along
Ch17SpinBH200224v1.pdf	p. 17-6, equation (11), first term on right hand side	$\dots - \omega^2 R^2)$	$\dots - \omega^2 R^2)dT^2$
Ch17SpinBH200224v1.pdf	p. 17-11, Line 294	In Query 2 you showed	In Query 1 you showed
Ch17SpinBH200224v1.pdf	p. 17-12, Line 317	singulariy	singularity
Ch17SpinBH200224v1.pdf	p. 17-17, Line 435	equation (40) in Section 1.10	equation (41) in Section 1.10
Ch17SpinBH200224v1.pdf	p. 17-20, equation (52)	Phythagoras	Pythagoras
Ch18CircleOrbitsSpin170905v3.pdf	p. 18-3, equation (15)	(15)q	(15)
Ch18CircleOrbitsSpin170905v3.pdf	p. 18-4, Line 112	angular momentum equation (110)	angular momentum equation (111)
Ch18CircleOrbitsSpin170905v3.pdf	p. 18-16, Line 361	expressions for $dT/d\tau$ and $d\Phi/d\tau$	expressions for $dT/d\tau$ and $d\Phi/dT$

Ch18CircleOrbitsSpin170905v3.pdf	p. 18-24, Line 572	equations (31) for $E/m$ and (32) for $L/m$	equations (32) for $E/m$ and (31) for $L/m$
Ch18CircleOrbitsSpin170905v3.pdf	p. 18-26, equation (66), denominator of right hand side	$2r^3(r - 3M)^{3/2}$	$2r^{3/2}(r - 3M)^{3/2}$
Ch19OrbitingSpin180113v1.pdf	p. 19-22, Line 518	singularity	singularity
Ch19OrbitingSpin180113v1.pdf	p. 19-24, Line 528	$r_2 = 0.17076M$	$r_1 = 0.17076M$
Ch19OrbitingSpin180113v1.pdf	p. 19-25, Line 602	the the black hole	the black hole
Ch20OrbitsOfLightAroundSpinningBH170906v1.pdf	p. 20-6, Line 122	reduce to equations (25) and (26)	reduce to equations (24) and (25)