Errata for
"Higher-Dimensional Algebraic Geometry"

by Olivier Debarre

I thank A. Alzati, A. Chambert-Loir, S. Druel, A. Höring, M. Lahyane and F. Loeser for suggesting some of the corrections below.

page 22

• line -10, for

"the left-hand side of this equality is nonnegative"

read

"the left-hand side of this equality is nonpositive"

page 27

• line -11, for

"nine points"

read

"nine general points"

page 31

• line 10, as of

"Recall also..."

replace the end of the proof of Proposition 1.43 by

" Each component of E has codimension 1 (1.40) hence, by shrinking Y again, we may assume that Y and E are smooth and irreducible. Set $U_0 = X - \mathrm{Sing}(\overline{\pi(E)})$, so that the closure in U_0 of the image of $E \cap \pi^{-1}(U_0)$ is smooth, of codimension at least 2. Let $\varepsilon_1 : X_1 \to U_0$ its blow-up; by the universal property of blow-ups ([H1], II, prop. 7.14), there exist an open subset V_1 of $\pi^{-1}(U_0)$ whose complement in Y has codimension at least 2 and a factorization

$$\pi|_{V_1} : V_1 \xrightarrow{\pi_1} X_1 \xrightarrow{\varepsilon_1} U_0 \subset X$$

and $\overline{\pi_1(E \cap V_1)}$ is contained in the support of the exceptional divisor of ε_1. If the codimension of $\overline{\pi_1(E \cap V_1)}$ in X_1 is at least 2, the divisor $E \cap V_1$ is contained in the exceptional locus of π_1 and, upon replacing V_1 by the complement V_2 of a closed subset of codimension at least 2 and X_1 by an open subset U_1, we may repeat the construction. After i steps, we get a factorization

$$\pi : V_i \xrightarrow{\pi_i} X_i \xrightarrow{\varepsilon_i} U_{i-1} \subset X_{i-1} \xrightarrow{\varepsilon_{i-1}} \cdots \xrightarrow{\varepsilon_2} U_1 \subset X_1 \xrightarrow{\varepsilon_1} U_0 \subset X$$

as long as the codimension of $\overline{\pi_{i-1}(E \cap V_{i-1})}$ in X_{i-1} is at least 2, where V_i is the complement in Y of a closed subset of codimension at least 2. Let $E_i \subset X_i$ be the exceptional divisor of ε_i. We have

$$\begin{aligned} K_{X_i} &= \varepsilon_i^* K_{U_{i-1}} + c_i E_i \\ &= (\varepsilon_1 \circ \cdots \circ \varepsilon_i)^* K_X + c_i E_i + c_{i-1} E_{i,i-1} + \cdots + c_1 E_{i,1} \end{aligned}$$

where $E_{i,j}$ is the inverse image of E_j in X_i and

$$c_i = \operatorname{codim}_{X_{i-1}}(\overline{\pi_{i-1}(E \cap V_{i-1})}) - 1 > 0$$

([H1], II, Ex. 8.5). Since π_i is birational, $\pi_i^* \mathcal{O}_{X_i}(K_{X_i})$ is a subsheaf of $\mathcal{O}_{V_i}(K_{V_i})$. Moreover, since $\pi_i(E \cap V_i)$ is contained in the support of E_i, the divisor $\pi_i^* E_i - E|_{V_i}$ is effective.

It follows that $\mathcal{O}_Y(\pi^* K_X + (c_i + \cdots + c_1)E)|_{V_i}$ is a subsheaf of $\mathcal{O}_{V_i}(K_{V_i}) = \mathcal{O}_Y(K_Y)|_{V_i}$. Since Y is normal and the complement of V_i in Y has codimension at least 2, $\mathcal{O}_Y(\pi^* K_X + (c_i + \cdots + c_1)E)$ is also a subsheaf of $\mathcal{O}_Y(K_Y)$. Since there are no infinite ascending sequences of subsheaves of a coherent sheaf on a Noetherian scheme, the process must terminate at some point: $\overline{\pi_i(E \cap V_i)}$ is a divisor in X_i for some i, hence $E \cap V_i$ is not contained in the exceptional locus of π_i (by 1.40 again). The morphism π_i then induces a birational isomorphism between $E \cap V_i$ and E_i, and the latter is ruled: more precisely, through every point of E_i there is a rational curve contracted by ε_i. This proves the proposition."

page 45

- line -3, for

"where $g(C) = 1 - \chi(C, \mathcal{O}_C)$, and"

read

"where, if d is the degree of f onto its image, f_*C is the 1-cycle $d\, f(C)$ (§1.1) and $g(C) = 1 - \chi(C, \mathcal{O}_C)$. We obtain from there"

page 47

after formula (2.4), add

"where again, if d is the degree of f onto its image, f_*C is the 1-cycle $d\, f(C)$."

page 48

- line 14, in formula (2.5), for

"$\mathcal{O}_\ell(1)^{n-1}$"

read

"$\mathcal{O}_\ell(1)^{N-1}$"

page 49

- line 9, for

"$\alpha(\lambda_2, \ldots, \lambda_n)$"

read

"$\alpha(\lambda_2, \ldots, \lambda_N)$"

page 50

- line 9, for

$$\sum_{i \in I_j} x_i^d = 0 \qquad \text{for all } j$$

read

$$x_{I_j} \neq 0 \quad \text{and} \quad \sum_{i \in I_j} x_i^d = 0 \qquad \text{for all } j$$

page 51

• line -1, for

"and the characteristic of $\mathbf{k}$ is $\geq d$."

read

"and the characteristic of $\mathbf{k}$ is 0 or $\geq d$."

page 53

• line -9, read

$$h^0(\ell, N_{\ell/X_N^d}(-1)) = N-1-\min(r,d) \qquad h^0(\ell, N_{\ell/X_N^d}) = 2N-2-\min(2r, d+1)$$

page 54

In Exercise 3.c), add a footnote:

"It was shown by Green (*Some Picard theorems for holomorphic maps to algebraic varieties*, Amer. J. Math. **97** (1975), 43–75) that over the complex numbers, for $d > n^2 - 1$, the image of any *holomorphic* map $\mathbf{C}^m \to X_n^d$ is contained in a linear subspace contained in X_n^d of the type described page 64. In particular, any rational or elliptic curve in X_n^d, or more generally, any image in X_n^d of a projective space or a complex torus, are contained in a linear subspace of this form."

page 56

• line -9, for

"1-cycle $\sum_{i=1}^r (\deg f|_{C_i}) f(C_i)$."

read

"1-cycle $\sum_{i=1}^r d_i f(C_i)$, where d_i is the degree of $f|_{C_i}$ onto its image. Note that for any Cartier divisor D on X, one has $D \cdot f_*C = \deg(f^*D)$."

page 57

• line 5, delete

"connected"

• line 8, delete

"We may assume that C is irrational"

• After the illustration, read

" If ev is defined at every point of $\{c\} \times \overline{T}$, the rigidity lemma 1.15(a) implies that there exist a neighborhood V of c in C and a factorization

$$\mathrm{ev}|_{V \times \overline{T}} : V \times \overline{T} \xrightarrow{p_1} V \xrightarrow{g} X$$

The morphism g must be equal to $f|_V$. It follows that ev and $f \circ p_1$ coincide on $V \times T$, hence on $C \times T$. But this means that the image of T in $\mathrm{Mor}(C, X; f|_{\{c\}})$ is just the point $[f]$, and this is absurd.

Hence there exists a point..."

page 59

• After the illustration, for

" *The rational cycle $f(C)$ bends and breaks.*

The surface S might not be smooth. On the other hand, we know that no component of a fiber of π is contracted by e (because it would then be contracted by $\overline{F}$).

Since $\overline{T}$ is a smooth curve and S is integral, π is flat ([H1], III, prop. 9.7); hence each fiber C is a 1-dimensional projective scheme without embedded component, whose genus is constant hence equal to 0 ([H1], III, cor. 9.10). In particular, any component C_1 of C_{red} is smooth rational, because $\mathcal{O}_{C_1}$ is a quotient of $\mathcal{O}_C$; hence $H^1(C_1, \mathcal{O}_{C_1})$ is a quotient of $H^1(C, \mathcal{O}_C)$, and therefore vanishes. In particular, if C is integral, it is a smooth rational curve.

Assume all fibers of π are integral..."

read

" *The rational cycle f_*C bends and breaks.*

Alternatively, the construction can be made as follows. The indeterminacies of the rational map $\mathbf{P}^1 \times \overline{T} \dashrightarrow X \times \overline{T}$ induced by F can be resolved by blowing up points to get a morphism

$$\overline{F}' : S' \to \mathbf{P}^1 \times \overline{T} \dashrightarrow X \times \overline{T}$$

whose Stein factorization is

$$\overline{F}' : S' \to S \xrightarrow{\overline{F}} X \times \overline{T}$$

In other words, the surface S is obtained from S' by contracting the components of fibers of $S' \to \overline{T}$ that are contracted by $\overline{F}'$. In particular, the (reduced) components of the fibers of $\pi : S \to \overline{T}$ are smooth rational curves, which are not contracted by $e : S \to X$ (because they would then be contracted by $\overline{F}$).

Assume that all fibers of π are integral..."

page 60

• line -7, for

"if D is a divisor associated with the line bundle $\mathcal{O}_Y(1)$"

read

"if D is a divisor associated with the line bundle $\mathcal{O}_X(1)$"

• line -5, for

$$-K_X = (r+1)D + \pi^*(-K_Y - D_1 - \cdots - D_r)$$

read

$$-K_X = rD + \pi^*(-K_Y - D_1 - \cdots - D_r)$$

page 61

- line 2, for

"It follows that $-K_Y$ is ample"

read

"It follows that $-K_X$ is ample"

page 64

- line 7, for

$$H \cdot \Gamma \leq \frac{2H \cdot C}{\mathrm{Card}(B)}$$

read

$$H \cdot \Gamma \leq \frac{2H \cdot f_*C}{\mathrm{Card}(B)}$$

page 65

- line -5, for

"$N^1(X)_{\mathbf{R}}$"

read

"$N^1(S)_{\mathbf{R}}$"

page 67

- line 11, for

$$H \cdot \Gamma \leq 2\dim(X)\ \frac{H \cdot C}{-K_X \cdot C}$$

read

$$H \cdot \Gamma \leq 2\dim(X)\ \frac{H \cdot f_*C}{-K_X \cdot f_*C}$$

- lines -7 and -5, for

$$-p^m K_X \cdot C$$

read

$$-p^m K_X \cdot f_*C$$

- line -3, for

"a rational curve Γ_m"

read

"a rational curve Γ_m on X"

• line -1, for

$$H \cdot \Gamma_m \leq \frac{2H \cdot C_m}{b_m} = \frac{2p^m}{b_m}(H \cdot C)$$

read

$$H \cdot \Gamma_m \leq \frac{2H \cdot (f_m)_* C_m}{b_m} = \frac{2p^m}{b_m}\ H \cdot f_* C$$

page 68

• line 1, for

"$-\dim(X)/(-K_X \cdot C)$."

read

"$-\dim(X)/(-K_X \cdot f_* C)$."

• line 3, for

$$H \cdot \Gamma_m \leq \frac{2\dim(X)}{-K_X \cdot C}(H \cdot C)$$

read

$$H \cdot \Gamma_m \leq \frac{2\dim(X)}{-K_X \cdot f_* C}\ H \cdot f_* C$$

• line 13, for

"of degree at most $2\dim(X)\frac{H \cdot C}{-K_X \cdot C}$"

read

"of degree at most $2\dim(X)\frac{H \cdot f_* C}{-K_X \cdot f_* C}$"

page 71

• line 1, delete

"connected"

page 77

• line 2, for

"any such morphism factors through α_X."

read

"any such morphism factors uniquely through α_X."

page 79

• line -4, for

"$\pi^{-1}(\pi(x))$"

read

"$\pi^{-1}(\pi(f(c)))$"

page 81

- line -12, delete

"connected"

page 83

- line -10, delete

"connected"

page 89

- lines 1 and 16, for

"for some d"

read

"for some positive d"

page 94

- line -3, for

"[Ha], III, prop. 4.6"

read

"[Ha], III, prop. 10.6"

page 98

- line 11, for

"the injection $\iota : \{0\} \times M \hookrightarrow X$"

read

"the injection $\iota : \{0\} \times M \hookrightarrow \mathbf{P}^1 \times M$"

- line 13, for

$$\pi_1(\iota) \circ \pi_1(\mathrm{ev}) = 0$$

read

$$\pi_1(\mathrm{ev}) \circ \pi_1(\iota) = 0$$

- line -10, for

"X^{free}"

read

"X_x^{free}"

page 114

- line -15, for

"an irreducible constructible subset"

read

"a constructible subset"

• from line -12 on, read

"The right-hand side is contained in the left-hand side. Let us prove the other inclusion. We may assume by Lemma 5.1 that V is irreducible. By [H1], II, ex. 3.18(b), V contains a subset U that is dense open in $\overline{V}$. Let W be a component of $\overline{V} - U$. By a theorem of Chevalley ([H1], II, ex. 3.22(e)), a general fiber of $W \to \pi(\overline{V})$ is either empty or everywhere of dimension

$$\dim(W) - \dim(\pi(\overline{V}))$$

which is less than the dimension $\dim(\overline{V}) - \dim(\pi(\overline{V}))$ of the fiber of $\overline{V} \to \pi(\overline{V})$ at the same point. It follows that for y general in $\pi(V)$, the closed subset $(\overline{V} - U) \cap \pi^{-1}(y)$ of $\overline{V} \cap \pi^{-1}(y)$ is nowhere dense, hence that $U \cap \pi^{-1}(y)$ is dense in $\overline{V} \cap \pi^{-1}(y)$."

page 116

• line 8, for

"separable closure of K and let"

read

"separable closure of K, and let"

page 117

• line -5, for

"of length m"

read

"of length 1"

page 118

• line 5, for

"$F(\overline{W_m^{i,j}})$"

read

"$\overline{F(W_m^{i,j})}$"

• line -12 on, read

" Call $\overline{V_m^i}$ *stable* if $\overline{F(\tilde{W}_m^{i,j})} = \overline{V_m^i}$ for all j, *unstable* otherwise. Note the following:

• if all components of $\overline{V_m(x)}$ are stable, $\overline{V_{m+1}(x)} = \overline{V_m(x)}$;

• if $\overline{V_m^i}$ is unstable, it is strictly contained in an irreducible component of $\overline{V_{m+1}(x)}$;

• if $\overline{V_m^i}$ is stable and an irreducible component of $\overline{V_{m+1}(x)}$, it is stable as a component of $\overline{V_{m+1}(x)}$.

Let $\overline{V_m^0} = \overline{F(\tilde{W}_{m-1}^{i,j})}$ be an unstable component of $\overline{V_m(x)}$. If the corresponding $\overline{V_{m-1}^i}$ is a stable component of $\overline{V_{m-1}(x)}$, it is equal to $\overline{V_m^0}$ by definition, which contradicts the third item. Hence $\overline{V_{m-1}^i}$ is unstable, and is strictly contained in $\overline{V_m^0}$ by the second item.

It follows that if $\overline{V_m(x)}$ has an unstable component $\overline{V_m^0}$, then $\overline{V_{m-1}(x)}$ also has an unstable component of smaller dimension. In particular, the dimension of $\overline{V_m^0}$ is at least m. By the second item, this implies $\dim(\overline{V_{m+1}(x)}) > m$, which is impossible since $m \geq \delta(x)$. Therefore, $\overline{V_m(x)}$ has only stable components, and $\overline{V_{m+1}(x)} = \overline{V_m(x)}$ by the first item. This proves the first step."

page 119

- line 5, for

$$V = \bigcup_{x \in X} \big(\{x\} \times V_n(x)\big)$$

read

$$V = \bigcup_{x \in X} \big(V_n(x) \times \{x\}\big)$$

page 123

- line -2, for

"hence factors as $X'^* \to X^* \xrightarrow{\rho} Y$,"

read

"hence factors as $X'^* \to X^* \xrightarrow{\rho} Y^*$,"

page 133

- line 7, delete

"Examples in Section 5.11 show that k may grow as $\log n$."

page 135

- line 11, for

"87 other families with Picard number > 1 ([MM])."

read

"88 other families with Picard number > 1 (Mori and Mukai recently noticed that the family of blow-ups of $\mathbf{P}^1 \times \mathbf{P}^1 \times \mathbf{P}^1$ along a curve of tridegree $(1, 1, 3)$ is missing from the list in [MM])."

page 136

- line -18, for

"the curve $C_1 = f^{-1}(C)$."

read

"the curve $C_1 = \pi^{-1}(C)$."

pages 136 and 137

- delete footnote 15 and replace footnote 16 with

" In this direction, complex **Q**-Fano threefolds with canonical singularities (see Definition 7.13) and Picard number 1 are known to form a limited family

([Ka4] for the case of terminal singularities; the canonical case is in Kollár, J., Miyaoka, Y., Mori, S. and Takagi, H., Boundedness of canonical **Q**-Fano 3-folds, *Proc. Japaan Acad. Ser. A Math. Sci.* **76** (2000), 73–77). The point is again to bound $(-K_X)^n$ *and* an integer j such that jK_X is a Cartier divisor. Work of Ran and Clemens ([RC]) shows that **Q**-Fano n-folds with canonical singularities and Picard number 1 form a limited family if one moreover bounds the smallest number m such that $-mK_X$ is very ample (in the smooth case, one can take $m = n(n+1)(n+3)$ as in the proof of Theorem 5.19).

More generally, it is conjectured that given $\varepsilon > 0$, Fano varieties X such that, for any desingularization $f : \tilde{X} \to X$, one has $K_{\tilde{X}} = f^*K_X + \sum a_i E_i$ with $a_i > -1 + \varepsilon$, where the E_i are the exceptional divisors of f, still form a limited family. Our surfaces fall in this class for $g = 0$ and $d < 2/\varepsilon$."

page 138

• line 2, read,

"or by noting that L and H are nef, and $L + H$ is ample, since its associated line bundle is the tautological line bundle associated with the description of X as $\mathbf{P}(\mathcal{O}^r_{\mathbf{P}^s}(1) \oplus \mathcal{O}^r_{\mathbf{P}^s}(a+1))$; it is therefore ample)."

• replace lines 11 through 15 with

Setting $n = \dim(X) = r + s$, we get, since L and H are nef, for $a = s$

$$(-K_X)^n \geq ((r+1)L)^n = (r+1)^n a^s L^r \cdot H^s = (r+1)^n a^s$$

• line -1, for

$H^0(\mathbf{P}^s, \mathcal{O}_{\mathbf{P}^s}(s-r))^r$

read,

$H^0(\mathbf{P}^s, \mathcal{O}_{\mathbf{P}^s}(s))^r$

page 141

• line 18, for

"yields the (5.3)."

read

"yields (5.3)."

page 146

• line 10, for

" the Riemann-Roch theorem yields

$$h^0(X, \mathcal{O}_X(mC)) = m + \chi(X, \mathcal{O}_X) \geq 2$$

and the linear system $|mC|$ has no base-point (the only possible fixed curve is C, but $h^0(X, \mathcal{O}_X((m-1)C)) < h^0(X, \mathcal{O}_X(mC))$, and there are no isolated base-points since $C^2 = 0$)."

read

" the Riemann-Roch theorem yields

$$h^0(X, \mathcal{O}_X(mC)) \geq m + \chi(X, \mathcal{O}_X) \geq 2$$

Since the only possible fixed curve in the linear system $|mC|$ is C, the moving part of the linear system $|mC|$ is of the form $|m'C|$ for some nonnegative integer $m' \leq m$. Since $(m'C)^2 = 0$, the linear system $|m'C|$ has no base-points."

page 147

- line -2, for

"Lemma 6.2(d)"

read

"Lemma 6.2(e)"

page 152

- line 3, for

$$H \cdot \Gamma_i < \varepsilon^{-1} K_X \cdot \Gamma_i \leq \varepsilon^{-1}(\dim(X) + 1)$$

read

$$H \cdot \Gamma_i < -\frac{1}{\varepsilon}\, K_X \cdot \Gamma_i \leq \frac{1}{\varepsilon}\, (\dim(X) + 1)$$

page 154

- line -14, for

"component of R"

read

"component of the locus of R"

page 157

- lines 31–32, read

"

$$K_X = -r\xi + \pi^*(K_Y + \det(\mathcal{E}))$$

If ℓ is the class of a line contained in a fiber of π, we have $K_X \cdot \ell = -r$."

page 158

- lines 19 and 24, for

"$d > 2g - 1$"

read

"$d \geq 2g - 1$"

page 160

- footnote 5: line -7, for

"Its blow-up is the total space of the $\mathbf{P}^1$-bundle $\mathbf{P}(\mathcal{O}_Q \oplus \mathcal{O}_Q(1)) \to Q$, where Q is a smooth quadric in $\mathbf{P}^3$, and the exceptional divisor is the image of the section corresponding to the trivial quotient of $\mathcal{O}_Q \oplus \mathcal{O}_Q(1)$."

read

"If Q is a smooth quadric in $\mathbf{P}^3$, and Q_0 and Q_∞ are the two sections of the $\mathbf{P}^1$-bundle $\mathbf{P}(\mathcal{O}_Q \oplus \mathcal{O}_Q(1)) \to Q$ corresponding to the quotients $\mathcal{O}_Q$ and $\mathcal{O}_Q(1)$ of $\mathcal{O}_Q \oplus \mathcal{O}_Q(1)$, its blow-up is $\mathbf{P}(\mathcal{O}_Q \oplus \mathcal{O}_Q(1)) - Q_\infty$ and the exceptional divisor is Q_0."

page 161

- footnote 7: line -6, read

$$\Big(1 - a_{22} - \frac{a_{12}a_{21}}{1 - a_{11}}\Big)[L_2] = \frac{a_{21}}{1 - a_{11}}(r_1 + z_1) + (r_2 + z_2)$$

page 162

- line 30, read

$$S_1^+ = \mathbf{P}(N^*_{\Gamma^+/X^+}) = \mathbf{P}(\mathcal{O}_{\mathbf{P}^1} \oplus \mathcal{O}_{\mathbf{P}^1}(1))$$

- footnote 9: line -3, for

"with exceptional divisor $S = \mathbf{P}(N_{C/Y})$."

read

"with exceptional divisor $S = \mathbf{P}(N^*_{C/Y})$."

page 163

- line 13, for

"relation $0 = -a + b$, which is absurd."

read

"relation $-1 = -a + b$, which is absurd."

- footnote 9: line -1, for

"which is split if $\deg(N_{C/Y}) \geq 3C_0^2 - 2$."

read

"which is split if $\deg(N_{C/Y}) \leq 3C_0^2 + 2$."

page 165

- line 8, for

"let M be a nef divisor"

read

"let M be an ample divisor"

page 179

- line 1, for

"with poles at every exceptional divisor"

read

"that vanishes along every exceptional divisor"

page 184

- footnote 8: for

"There are now simple proofs of this statement (see [AJ], [BP])."

read

"There are now simple proofs of this statement (see [AJ], [BP], and especially K. H. Paranjape, *The Bogomolov–Pantev resolution, an expository account*, New trends in algebraic geometry (Warwick, 1996), Cambridge University Press, Cambridge, 1999, pp. 347–358)."

page 195

- line 25, for

"let $B(b)$ be the base-locus"

read

"let $B(b)$ be the (reduced) base-locus"

page 196

- lines 9–12, read

"(b) $K_Y \sim \pi^*(K_X + \Delta) + \sum_i a_i F_i$, with $a_i > -1$ for all i;

(c) the divisor $\pi^*(aD - (K_X + \Delta)) - \sum_i p_i F_i$ is ample, where $p_i \in (0, 1 + a_i)$ for all i."

- line -10, for "property (b)", read "property (c)"

page 197

- line -7, for "rays)." read "rays."
- line -1, for "(1.29)." read "(1.29))."

page 199

- line -14, for

"Let $B(p,q)$ be its base-locus."

read

"Let $B(p,q)$ be its (reduced) base-locus."

page 200

- line -9 on, read

"There exists as in the proof of the base-point-free theorem 7.32 a desingularization $\pi : Y \to X$ and divisors F_i on Y (not necessarily exceptional) such that

(a) the linear system $|\pi^*(p_0 H + q_0 j_{X,\Delta}(K_X + \Delta)) - \sum_i r_i F_i|$ is base-point-free, where $r_i \geq 0$ for all i;

(b) $K_Y \sim \pi^*(K_X + \Delta) + \sum_i a_i F_i$, with $a_i > -1$ for all i;

(c) the divisor $\pi^*(p_0 H + (q_0 j_{X,\Delta} - 1)(K_X + \Delta)) - \sum_i p_i F_i$ is ample, where $p_i \in (0, 1 + a_i)$ for all i."

page 201

- line 13, for "aq_0" read "$j_{X,\Delta}q_0$"
- line -11, for "$-(K_X + \Delta)$" read "$-\pi^*(K_X + \Delta)$"

page 202

- line 10, for

"the base-locus of the left-hand side"

read

"the (reduced) base-locus of the left-hand side"

page 212

- line -17, for "exact sequences" read "spectral sequences"

page 219

- after Exercise 8, add a new exercise:

Let X be a smooth projective variety of dimension n such that $(-K_X)^n > 0$ and $K_X \cdot C < 0$ for every curve C on X. Show that X is a Fano variety. (*Hint*: use the base-point-free theorem 7.32.)