Errata of the second printing

Our thanks go to all our friends that have contributed to this list.

On page 8, on the left side of the first formula from the top, replace

$$\left(\bigcup_i A_2^i\right)(x_1)\ ,$$

by

$$\left(\bigcup_i A^i\right)_2(x_1)\ .$$

On page 11, last paragraph, replace '$A_0 \subset \mathcal{A}$ and every $B \subset \Sigma$.' by '$A_0 \in \mathcal{A}$ with $\mu(A_0) < \infty$ and every $B \in \Sigma$.'

On page 84, ninth line from the bottom, replace

$$j_\varepsilon(x) = \varepsilon^{-n} j(\varepsilon/n)$$

by

$$j_\varepsilon(x) = \varepsilon^{-n} j(x/\varepsilon)$$

On page 169, just before equation 11 it was stated that the kernel of $e^{\{-t\sqrt{p^2+m^2}\}}$ can be computed explicitly in three dimensions. In fact this can be done in any dimension as was pointed out to us by Walter Schneider. The answer is

$$e^{\{-t\sqrt{p^2+m^2}\}}(x,y) = 2^{-\frac{n-1}{2}}\pi^{-\frac{n+1}{2}} t m^{\frac{n+1}{2}} (|x-y|^2+t^2)^{-\frac{n+1}{4}} K_{\frac{n+1}{2}}(m(|x-y|^2+t^2)^{1/2})\ ,$$

for $x, y \in \mathbf{R}^n$. This follows from

$$\int_{\S^{n-1}} e^{i\omega\cdot x} \mathrm{d}\omega = (2\pi)^{n/2}|x|^{1-\frac{n}{2}} J_{\frac{n}{2}-1}(|x|)\ ,$$

and from

$$\int_0^\infty x^{\nu+1} J_\nu(xy) e^{-\alpha(x^2+\beta^2)^{1/2}} \mathrm{d}x$$

$$= (\frac{2}{\pi})^{1/2} \alpha \beta^{\nu+3/2} (y^2 + \alpha^2)^{-\nu/2-3/4} y^\nu K_{\nu+3/2}(\beta(y^2+\alpha^2)^{1/2}) \ .$$

Here J_ν is the Bessel function of ν-th order. Using that

$$K_\mu(z) \approx \frac{1}{2}\Gamma(\mu)(\frac{1}{2}z)^{-\mu}$$

as $z \to 0$ and $Re\mu > 0$, we easily obtain formula (10) on page 169.

On page 235, fourth line from the bottom, in equation (3), replace $4\pi^2$ by $2\pi^2$.

On page 146, fifth line before the end of Sect. 6.18, replace 'Such sets need not be 'small', e.g. α could be all the rational numbers, and hence α could be dense in $\mathbb{R}$. ' by 'Such sets need not be 'small', e.g., A could be all the rational numbers, and hence A could be dense in $\mathbb{R}$. '

Errata as of June 17, 1999

On page 7, at the end of the fourth paragraph, replace 'unit side length' by 'unit edge length'.

On page 11, seventh line after the statement of Theorem 1.4, replace $B_2 = A_1 \sim A_2$ by $B_2 = A_2 \sim A_1$.

On page 11, second line from the bottom, replace 'for every $A_0 \subset \mathcal{A}$ and every $B \subset \Sigma$.' by 'for every $A_0 \in \mathcal{A}$ with $\mu(A_0) < \infty$ and $B \in \Sigma$.'

On page 12, second and fourth line from the top, replace $A_i \subset \mathcal{A}$ by $A_i \in \mathcal{A}$ and $B \subset \Sigma$ by $B \in \Sigma$.

On page 12, fourth line from the bottom, replace the sentence 'To prove measurability, note that when f is lower semi continuous then the set $\{x : f(x) < t+1/j\}$ is measurable.' by the sentence 'To prove measurability when f is upper semi continuous, note that the set $\{x : f(x) < t+1/j\}$ is measurable.'

On page 16, in the middle integral of formula (8), replace $\mu(\mathrm{d}x)$ by $\mu(\mathrm{d}x)\mathrm{d}a$.

On page 16, on the third line of the penultimate paragraph replace 'Beppo–Levi' by 'Levi'.

On page 17, delete the cautionary sentence in the statement of Theorem 1.6. Since it has been assumed that the functions are summable, it is not necessary to require that they be nonnegative. Delete the word *nonnegative* in the hypothesis of the theorem. Add the following sentence at the beginning of the proof:

We can assume that $f^1(x) \geq 0$ for otherwise just consider the functions $f^j - f^1$ and $f - f^1$, which are nonnegative.

On page 23, in the statement of Theorem 1.10, replace 'Then f is μ_2-measurable, g is μ_1-measurable ...' by 'Then f is Σ_2-measurable, g is Σ_1-measurable ...'

On page 23, in the fourth line from below, the formula

$$(A_1 \times B_1) \sim (A_2 \times B_2) = [(A_1 \sim A_2) \times B_1] \cup [A_2 \times (B_1 \sim B_2)],$$

is incorrect and should be replaced by the formula

$$(A_1 \times B_1) \sim (A_2 \times B_2) = [(A_1 \sim A_2) \times B_1] \cup [(A_1 \cap A_2) \times (B_1 \sim B_2)].$$

On page 32, second line in Exercise 6, replace 'Remark (3)' by 'Remark(4)'

On page 33, Exercise 15, third line after '*Hints*', replace 'construct a function $\psi \in C_c^0(\Omega)$' by 'construct a function $\psi_\varepsilon \in C_c^0(\Omega)$'

On page 36, eighth line from the bottom, replace '**essential supremum** of f' by '**essential supremum** of $|f|$'

On page 40, sixth line from the bottom, after 'assume that $\Omega = A$.' add '(Why is $\int fg\mathrm{d}\mu$ defined?)'.

On page 41, in the penultimate line of the statement of Theorem 2.4, replace $1 \leq p < \infty$ by $1 < p < \infty$.

On page 45, replace the first displayed formula

$$\lim_{t\to 0}[|f+tg|^p - |f|^p]/t = |f|^{p-2}(\overline{f}g + f\overline{g}),$$

by

$$\lim_{t\to 0}[|f+tg|^p - |f|^p]/t = \frac{p}{2}|f|^{p-2}(\overline{f}g + f\overline{g}),$$

On page 49, second line above formula (7), replace '$L^{p'}(\Omega)$ is a subset of $L^p(\Omega)$' by '$L^{p'}(\Omega)$ is a subset of $L^p(\Omega)^*$'

On page 59, eleventh line from the bottom, the statement 'If $p \le 2$, Hölder's inequality shows that

$$\|f_\varepsilon - f\|_p \le |B_R|^{1/p-1/2}\|f_\varepsilon - f\|_2$$

where $|B_R|$ denotes the volume of the ball B_R.' is not correct. Replace it by 'If $p \le 2$, split j into two functions, one having support inside the ball of radius R' and the other having support outside this ball. Hölder's inequality then shows that

$$\|f_\varepsilon - f\|_p \le |B_{R+R'}|^{1/p-1/2}\|f_\varepsilon - f\|_2 + C(R')\|f\|_p$$

where $|B_{R+R'}|$ denotes the volume of the ball $B_{R+R'}$ and $C(R') \to 0$ as $R' \to \infty$ uniformly in f.'

On page 62, eight lines from the bottom, delete one of the 'of subsequences'.

On page 64, fourth line in the proof of Lemma 2.20, replace $\|f_\delta - f\|_p < \delta$ by $\|f_\delta - f\|_p \le \delta$

On page 79, seventh line in the proof of Theorem 3.7, replace 'Sects. 4.22' by 'Sects. 4.3'.

On page 83, in the second displayed formula from the top, replace '$TSR_\alpha\chi_{F_k(l)}$' by '$TSR_\alpha\chi_{F_{k(l)}}$'. I.e., $F_k(l)$ is replaced by $F_{k(l)}$.

On page 92, add the following after the statement of the fully generalized Young's inequality. 'To get Young's inequality take $J = 0$, $k = 3$ and $B_1 = (1, 0), B_2 = (1, -1)$ and $B_3 = (0, 1)$.'

On page 92, after the word 'Theorem 4.2' and before 'Proof of Theorem 4.2', insert the following: 'The inequality is correct as stated above, but it should be noted that both (7) and (8) are infinite if $\sum 1/p_j \neq M - 1$.'

On page 93, in the formula above formula (11), replace $(x - y - z)^2$ by $|x - y - z|^2$, y^2, z^2, x^2 by $|y|^2, |z|^2, |x|^2$.

On page 96, seventh line from the bottom, replace $-a/2$ by $-2a$.

On page 105, in formula (13), replace

$$\mathcal{J}_{\mathbb{S}}(x) \text{ and } \mathcal{J}_{\mathbb{S}^{-1}}(x) \ ,$$

by

$$\mathcal{J}_{\mathcal{S}}(x) \text{ and } \mathcal{J}_{\mathcal{S}^{-1}}(x) \ .$$

On page 106, in formula (5), remove superfluous parentheses, i.e., replace

$$\left(\frac{2}{1 + |x|^2)} |x - y|^2 \frac{2}{1 + |y|^2} \right)$$

by

$$\left(\frac{2}{1 + |x|^2} |x - y|^2 \frac{2}{1 + |y|^2} \right)$$

On page 107, in formula (9), replace $Ds = (s_1, \ldots, s_{n+1}, -s_n)$ by $Ds = (s_1, \ldots, s_{n-1}, s_{n+1}, -s_n)$.

On page 108, in the formula following (11), replace $(DS)_{n+1}$ by $(Ds)_{n+1}$.

On page 111, in the third displayed formula from above, change

$$\lim_{l \to \infty} \|f^{k_l}\|_p$$

into

$$\lim_{l\to\infty} \|f^{k_l}\|_p \ ,$$

i.e., change $l \rightharpoonup \infty$ into $l \to \infty$.

On page 127, at the beginning of the second paragraph, replace 'A theory developed around the notion that every $L^1_{\rm loc}$–function is differentiable is the theory of distributions (see[Schwartz], [Hörmander] , . . .)' by 'A theory developed around the notion that every $L^1_{\rm loc}$–function is differentiable is the theory of distributions invented by [Schwartz] (see [Hörmander] , . . .)'

On page 128, third line from the bottom, replace 'There is the obvious . . .' by 'There is an obvious . . ..

On page 135, third line before the end of Sect. 6.8, replace T_m by T.

On page 150, in the formula on the top, replace I by I_B.

On page 155, in Exercise 4, replace 'satisifies' by satisfies'.

On page 157, at the end of Sect. 7.1, replace the parenthetical remark by the following '(but see Remark 7.5 below about the Meyers–Serrin Theorem 7.6)'

On page 162, top paragraph, replace x^2 by $|x|^2$ everywhere.

On page 163, sixth line from the top, replace '*monotonically* in $H^1(\mathbb{R}^n)$' by ' in $H^1(\mathbb{R}^n)$ and it converges monotonically pointwise'.

On page 176, first and seventh line in Sect. 7.18, replace R^n by $\mathbb{R}^n$ in two places.

On page 188, in the penultimate line of the proof of Theorem 8.3, replace $(\mu^2 + (x-a)^2)^{(n-2)/2}$ by $(\mu^2 + |x-a|^2)^{-(n-2)/2}$.

On page 190, in the second formula from the top, raise the right side to the power -2, i.e., replace

$$q^{1-2/q}(q-1)^{-1+1/q}((q-2)/8\pi)^{1/2-1/q}$$

by

$$\left[q^{1-2/q}(q-1)^{-1+1/q}((q-2)/8\pi)^{1/2-1/q}\right]^{-2} \ .$$

Do precisely the same in the fourth formula from the top, in other words replace

$$(q-1)^{-1/2+1/2q}(q(q-2)/2\pi)^{1/2-1/q} \ ,$$

by

$$\left[(q-1)^{-1/2+1/2q}(q(q-2)/2\pi)^{1/2-1/q}\right]^{-2} \ .$$

On page 192, in the first line of the proof of Theorem 8.6, omit the word 'uniformly'.

On page 193, in formula (4), replace

$$(2\pi t)^{-n/2}\int \exp[-(x-y)^2/2t]f(y)\mathrm{d}y \ ,$$

by

$$(4\pi t)^{-n/2}\int \exp[-|x-y|^2/4t]f(y)\mathrm{d}y \ .$$

On page 194, in the ninth line from the bottom, replace $1/p = 1/r + 1/p$ by $1/p = 1/r + 1/2$.

On page 196, in the third line of the proof of Corollary 8.7, replace $f^{n_2(j)}$ by $f^{n_1(j)}$.

On page 217, in the integral in formula (2) replace x by y two times.

On page 228, third and fourth line from the bottom, exchange 'first' and 'second'.

On page 245, in the first line from the top, replace $u_0(x)$ by $\psi_0(x)$. Also, in the formula below, replace E by E_0.

On page 254, fourth line above formula (3), replace $\mathrm{Cap}(A) = R^{2-n}$ by $\mathrm{Cap}(A) = R^{n-2}$

On page 255, in formula (6) replace $|x|^{-1}$ by $|x|^{2-n}$.

On page 270, in the sixth reference from the bottom, replace 'Ann. Math. **18**' by 'Ann. Math.**118**'

Errata as of June 26, 1999

On page 91, in the fourth line above equation (4), replace $e^{i\theta(x)}$ by $e^{-i\theta(x)}$.

Errata as of September 25, 1999

On page 45, tenth line from the top, replace '(for $t \leq 1$)' by '(for $|t| \leq 1$)', i.e., put the absolute value signs around t.

Errata as of October 6, 1999

On page 98, third line from above, replace 'independent of f and g' by 'independent of f and h'.

Errata as of October 14, 1999

On page 109, in the first line of the proof, replace f^* by f^k.

Errata as of November 16, 1999

On page 134, in the last displayed formula, put an absolute value sign on the left side of the inequality.

Errata as of January 19, 2000

On page 103, in the second line replace $s^{p/n}f(sx)$ and $s^{q/n}h(sx)$ by $s^{n/p}f(sx)$ and $s^{n/r}h(sx)$.

On page 105, in formula (9), replace $f(\mathcal{S}^{-1}(x))$ by $f(\mathcal{S}^{-1}(s))$, and in formula (13) replace $(1+s_{n+1})^n$ by $(1+s_{n+1})^{-n}$.

On page 108, formula (12) should read

$$(D^*f)(x) = \left(\frac{2}{|x+a|^2}\right)^{n/p} f\left(\frac{2x_1}{|x+a|^2}, \dots, \frac{2x_{n-1}}{|x+a|^2}, \frac{|x|^2-1}{|x+a|^2}\right) .$$

On page 10, first displayed equation, replace A_n by A_i.

On page 11, at the beginning of PROOF, replace 'as sumption' by 'assumption', and replace 'consider' by 'Consider'.

On page 38, in Theorem 2.2, replace the second sentence by the following:

Let f be a real-valued function on some set Ω that is measurable with respect to some Σ-algebra and let μ be a measure on Σ.

In the next sentence replace μ-measurable by Σ-measurable.

Errata as of September 7, 2000

On page 99, in formula (7) put absolute value signs around the formula on the left.

Errata as of September 8, 2000

On page 16, in the last paragraph, replace 'Σ- almost everywhere' by 'μ- almost everywhere'.