Preface to the 2009 reprinting

We continue to enjoy a steady stream of enthusiastic comments from readers all over the world, unabated even after 32 years! This reprinting appends known corrections to the Second Edition. In answer to one common query: Sorry, but we never did get around to writing the second volume that we had in mind when preparing the original Preface. Most of the time we still tend to be in different countries—usually continents—and busy with other things geometrical. Differential geometry remains at the forefront of mathematical research, with applications linking into many areas of physics through geometrical field theory and mathematical statistics through information geometry. We hope that you enjoy our presentation of the basics that underpin these new developments.

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page 19 line -2  
... as on page 4, with its

page 45 line -3  
$\bigcap\{X'|X\text{an affine subspace of }X\text{containing }S\}$

page 49 line 10  
$y + \frac{1}{2}d(y, x) = ...$

page 52 line 7  
... $\left(1 - \frac{\lambda(1-\mu)}{1-\lambda\mu}\right)z$ ...

page 55 line 16  
... $= x' + \frac{1}{2}d(x', y')$ if and only if ...

page 55 line 23  
... $\to (Y, S)$ is affine ...

page 55 line 24  
... is a mapping $T \to S$.

page 55 line 25  
... Axioms Fi, Fii on p.6. Use ...

page 61 line 7 (centre of first equation)  
$$
\begin{bmatrix}
  x^1 \\
  \vdots \\
  x^n
\end{bmatrix}
= 
\begin{bmatrix}
  b_1^1 & \cdots & b_1^n \\
  \vdots & \ddots & \vdots \\
  b_n^1 & \cdots & b_n^n
\end{bmatrix}
$$

page 67 line 8  
... space of all bilinear forms ...

page 74 line -15  
is crucial. Continuity ...
... with \( i = 1, \ldots, k \), so that if \( x \cdot y = 0 \) for all \( y \in B(k) \), ...

... but not all are eigenvectors ...

\[ x \otimes y + x' \otimes y' = \ldots \]

\((g, x_2) \mapsto (x_1 \mapsto x_2(g(x_1)))\)

\[ \cdots \rightarrow X \otimes X \otimes X^* \otimes X \otimes X^* \]

\[ = b'_i(x^j a^j_i). \]

... Prove that if \( \Psi \) is the ...

... we have \( \Psi A(x, y) = Ax \cdot y. \)

... Prove that \( \Psi A \) is non-degenerate ...

\[ \Rightarrow | \sum_{i=1}^{n} f_i(y) - \sum_{i=1}^{n} f_i(x) | < \epsilon \]

(cf. Chapter II.\( \S \)3).

... that this limit may exist ...

\[ f \circ \phi_a^{-} \text{ is } C^j \text{ at } \phi_a(x) \iff f \circ \phi_b^{-} \text{ is } C^j \text{ at } \phi_b(x). \]

... situation of Definition 2.02, ...
\(\psi' \circ f \circ \phi'\) is \(C^k\) at \(\phi'(x) \iff \psi \circ f \circ \phi\) is \(C^k\) at \(\phi(x)\).

\(v(w(fg) - w(v(fg))) = \ldots\)

... \(\psi((x, y), t) = (x + ty, y)\) and

\(\phi((x, y), t) = (x, y + t)\) we have ...