wherein the step of filtering to remove noise from D2 comprises using the modified method of sieves to remove said noise, using the equations:

$$I(x)=\Sigma_y h_0(x-y)D2(y)$$

$$I(x)=\Sigma_y h_3(x-y)D2(y)$$

$$I(x)=\Sigma_y h_4(x-y)D2(y)$$

where h_3 and h_4 are two and three pixel wide point spread functions for removing noise by averaging adjacent pixels together, and where h_0 represents the optical system point spread function.

3. The method according to claim **1**, wherein the reconstructed background $I_r(x)$ is obtained using the Richardson-Lucy reconstruction technique.

4. The method according to claim **2**, further comprising reconstructing new point spread functions (h_{3T}, h_{4T}) to account for the combined effect of the method of sieves two and three pixel wide point spread functions, and the optical system point spread functions.

5. The method according to claim **4**, wherein the step of reconstructing the background $I_r(x)$ further comprises:

a) estimating the true background scene data;

b) blurring the estimate of the true background scene data;

c) dividing on a pixel by pixel basis the noisy scene data (D**3**, D**4**) by the blurred estimate of the true background scene data to create a new array (T**3**, T**4**);

d) correlating said new array with the complete method of sieves and optical system point spread functions and multiplying the result on a pixel by pixel basis with the current estimate of the true background scene data to provide a new estimate of said true background scene Z(x); and

e) taking the new estimate of the true background scene to be the reconstructed background scene ($I_r(x)$).

6. The method according to claim **5**, further comprising the step of determining whether a threshold number of iterations has been met and repeating substeps b–e of claim **5** until said threshold is achieved.

7. The method according to claim **5**, wherein the noise suppressed values D**3** and D**4** are used as the first estimate of the true background scene.

8. The method according to claim **5**, wherein the step of correlating the new array to obtain a new estimate of the true background scene further comprises using said new point spread functions, h_{3T} and h_{4T}, where

$$Z3(x)=\Sigma_y T3(y)h_{3T}(y-x)$$

$$Z4(x)=\Sigma_y T4(y)h_{4T}(y-x)$$

$$Z(x)=I_n(x)[Z3(x)+Z4(x)]/2.$$

9. In an optical system having a detector means and processor means in which image data is obtained comprising noisy blurred scene data containing an object to be reconstructed (D**1**), and noisy blurred background data (D**2**) of the same scene, an improved method for increasing the spatial resolution of the imaging data produced by the diffraction limited optical system, the improvement therewith comprising:

filtering the noisy blurred background data (D**2**) of the same scene to obtain noise suppressed data;

applying estimations of point spread functions associated with the noise suppressed data and optical system in the noise suppressed data to obtain a reconstructed background image ($I_r(x)$); and

low pass filtering the noisy blurred scene data containing the object to be reconstructed (D**1**) and using the reconstructed background image ($I_r(x)$) to eliminate the background data from said image data to obtain a reconstructed image of the object with increased spatial resolution;

wherein the step of eliminating the background data further comprises:

a) separating out a first estimate $D_0(x)$, in reconstructed object data from the filtered D**1** data;

b) replacing reconstructed background scene pixels by estimated reconstructed object pixels at predetermined object positions to obtain an image indicative of the reconstructed background and estimated reconstructed object (S(x));

c) blurring the combination of the reconstructed background and estimated reconstructed object to obtain a blurred image $I_s(x)$;

d) dividing on a pixel basis the filtered D**1** scene data by the blurred combination of the reconstructed background and estimated reconstructed object data to obtain a new array of image data N(x);

e) correlating said new array N(x) with the optical system point spread function and multiplying for each pixel specified by the current estimate of the reconstructed object to provide a new estimate of said reconstructed object;

f) taking the new estimate of the reconstructed object to be the reconstructed image of the object having increased spatial resolution.

10. The method according to claim **9**, further comprising the step of determining whether a threshold number of iterations has been met and repeating steps b–f of claim **9** until said threshold is achieved.

11. The method according to claim **9**, wherein the step of separating out a first estimate of the reconstructed object from the filter data D**1**, further comprises using binmap values specifying the position in a scene of the object to be resolved in combination with the filtered data ($D_f(x)$) to obtain $D_0(x)$, where

$$D_0(x)=\text{binmap}(x)\cdot D_f(x).$$

12. The method according to claim **11**, wherein the predetermined object positions for replacing the reconstructed background scene pixels by the estimated reconstructed object pixels S(x) are specified by the binmap values, where

$$S(x)=I_r(x)(\text{binmap}(x)-1)+\text{binmap}(x)D_0(x).$$

13. The method according to claim **12**, wherein the step of blurring the combination of the reconstructed background and estimated reconstructed object data uses the optical system point spread function, where

$$I_s(x)=\Sigma_y h_0(x-y)S(y).$$

14. In an optical system having a detector means and processor means in which image data is obtained comprising noisy blurred scene data containing an object to be reconstructed (D**1**), and noisy blurred background data (D**2**) of the same scene, an improved method for increasing the spatial resolution of the imaging data produced by the optical system, the improvement therewith comprising:

obtaining filtered data by filtering the noisy blurred background data (D**2**) of the same scene;