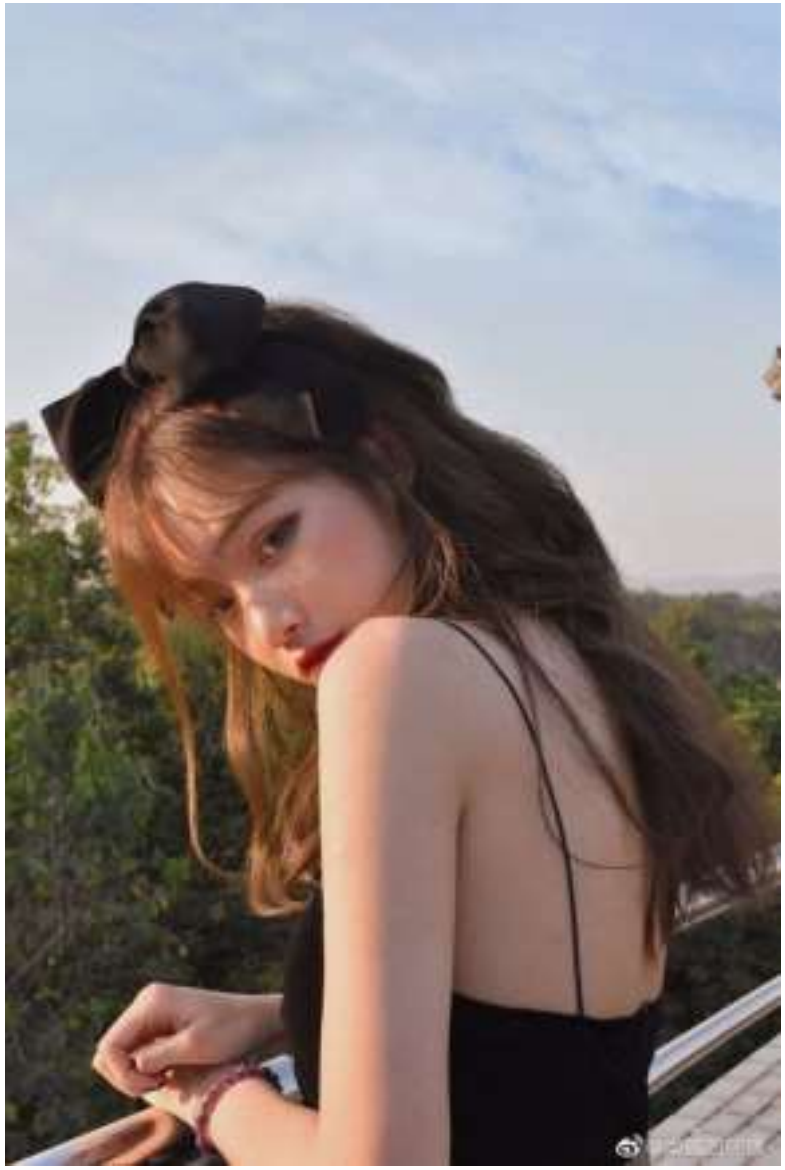
results

In [ ]:
```
plot_image_color(I_color, 'input image in color')
```

input image in color



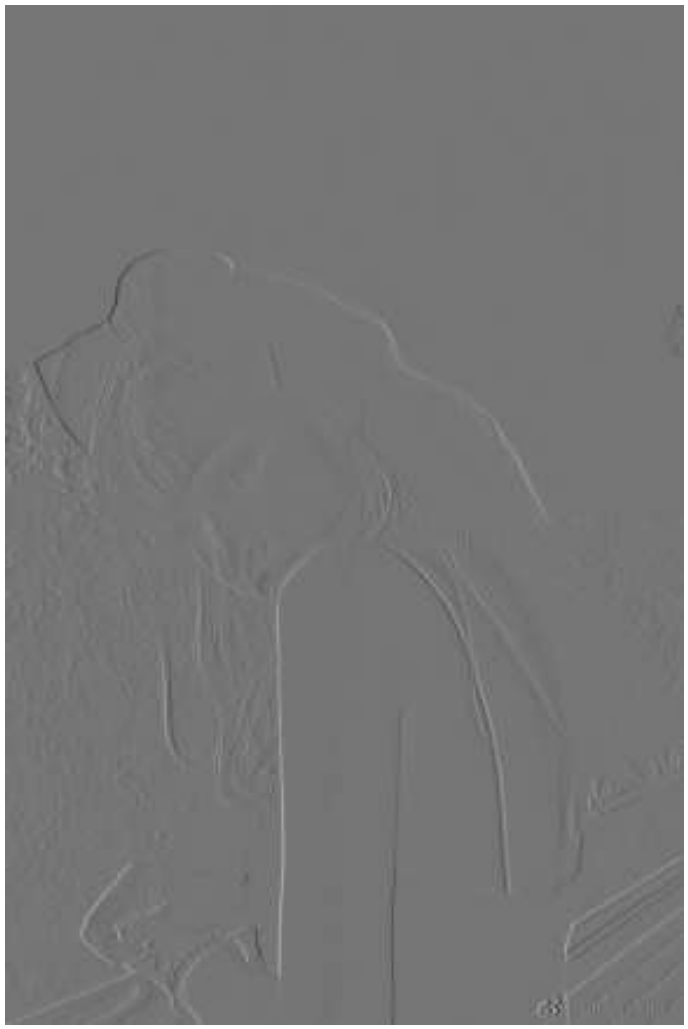
02. plot the input image in gray

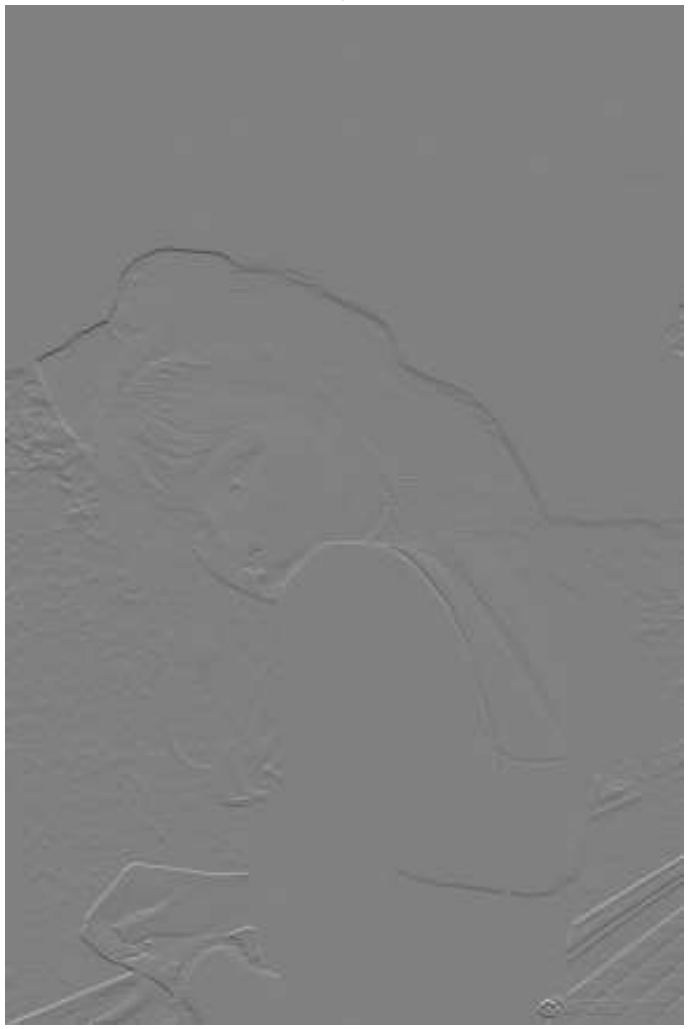
In [ ]:
```
plot_image_gray(I, 'input image in grey')
```

input image in grey

03. plot the (forward) first derivative I_x and I_y of input gray image I with Neumann boundary condition

In [ ]:
```
plot_image_gray_2x1(Ix, Iy, '$I_x$','$I_y$')
```



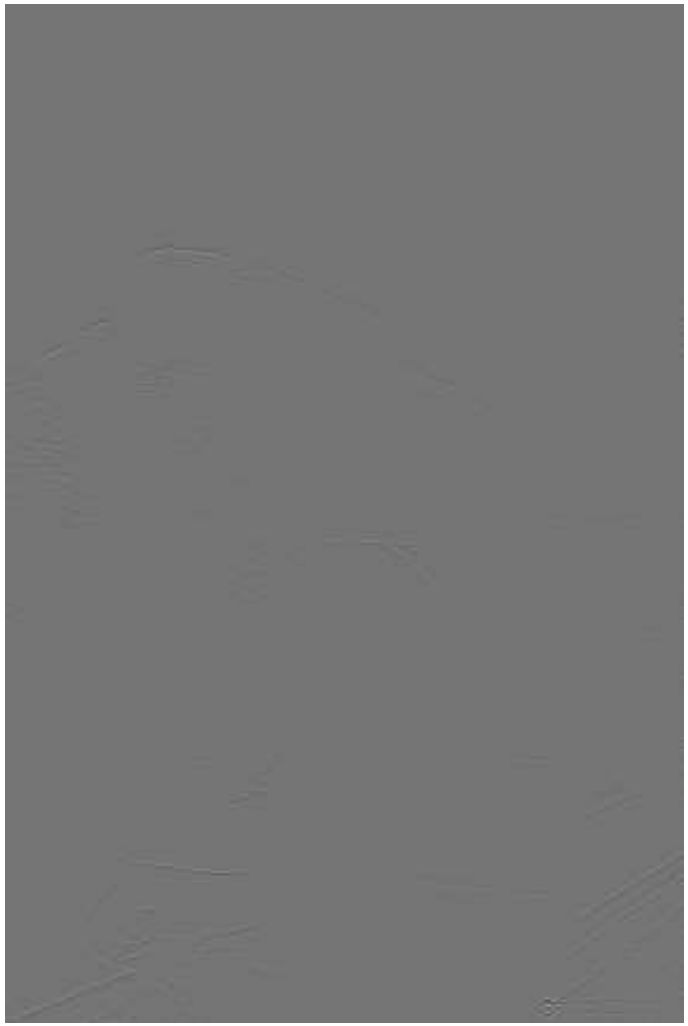


04. plot the second derivative I_{xx} and I_{yy} of input gray image I with Neumann boundary condition

In [ ]:
```
plot_image_gray_2x1(Ixx, Iyy, '$I_{xx}$', '$I_{yy}$')
```

I_{xx}

I_{yy}



05. plot the original image and its solution of the heat equation with 10, 100, 1000 iterations

In [ ]:
```
plot_image_gray_2x2(I, u10, u100, u1000, 'original $I$', '$u(t=10)$', '$u(t=100)$', '$u(t=1000)$')
```

original I

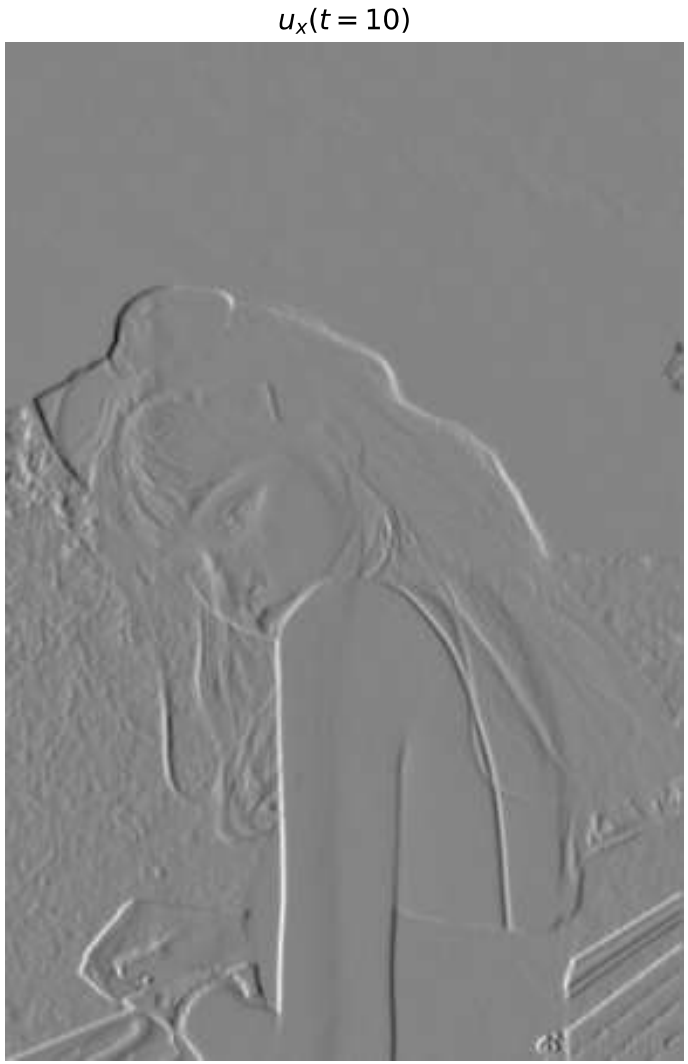
$u(t=10)$

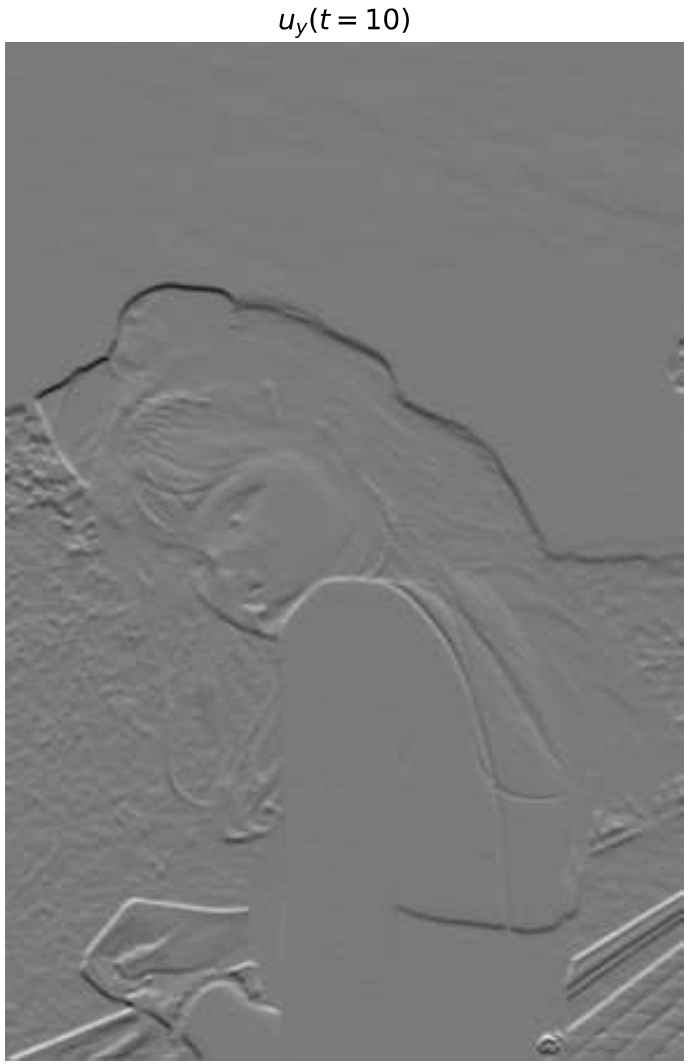
$u(t=100)$

$u(t=1000)$

06. plot the (forward) first derivative of the solution of the heat equation with 10 iterations

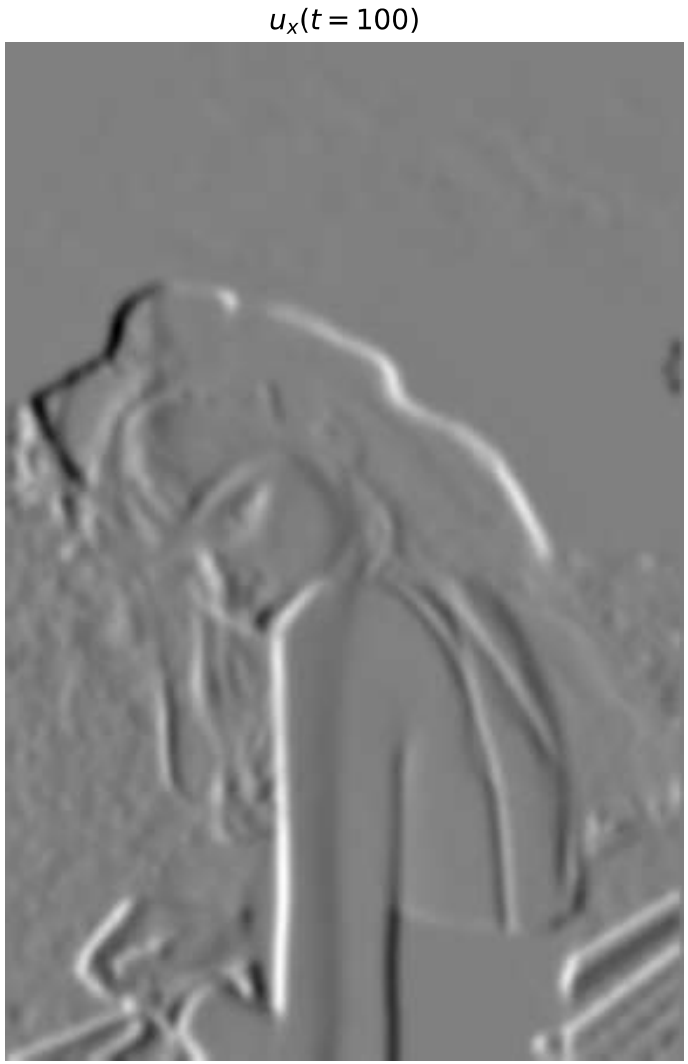
In [ ]:
```
plot_image_gray_2x1(u10_x, u10_y, '$u_x(t=10)$', '$u_y(t=10)$')
```

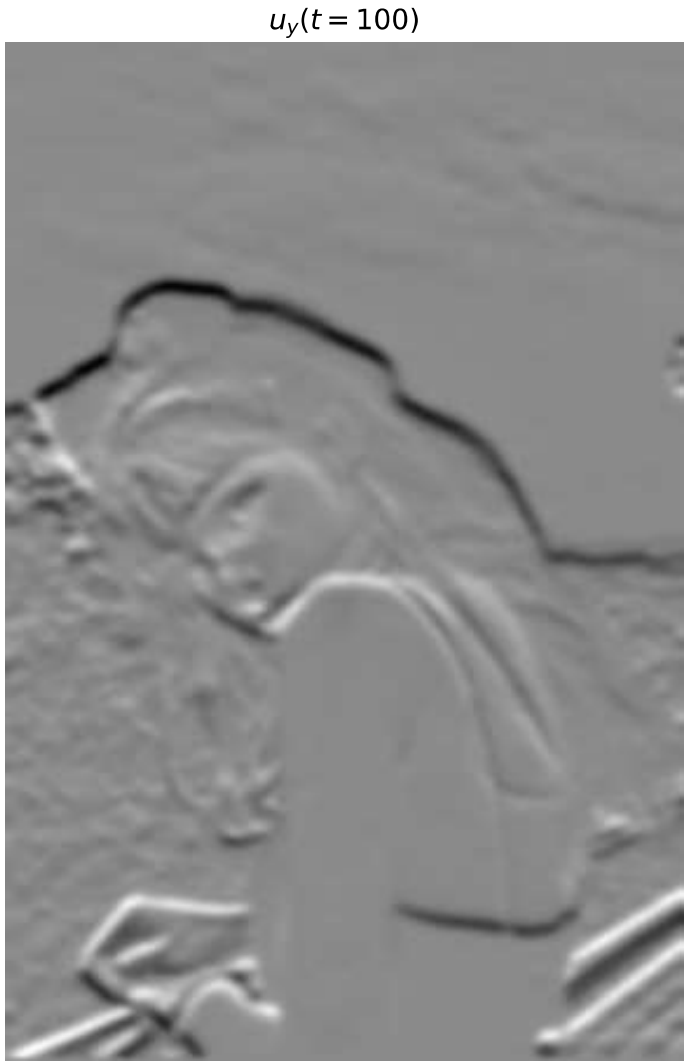




07. plot the (forward) first derivative of the solution of the heat equation with 100 iterations

In [ ]:
```
plot_image_gray_2x1(u100_x, u100_y, '$u_x(t=100)$', '$u_y(t=100)$')
```

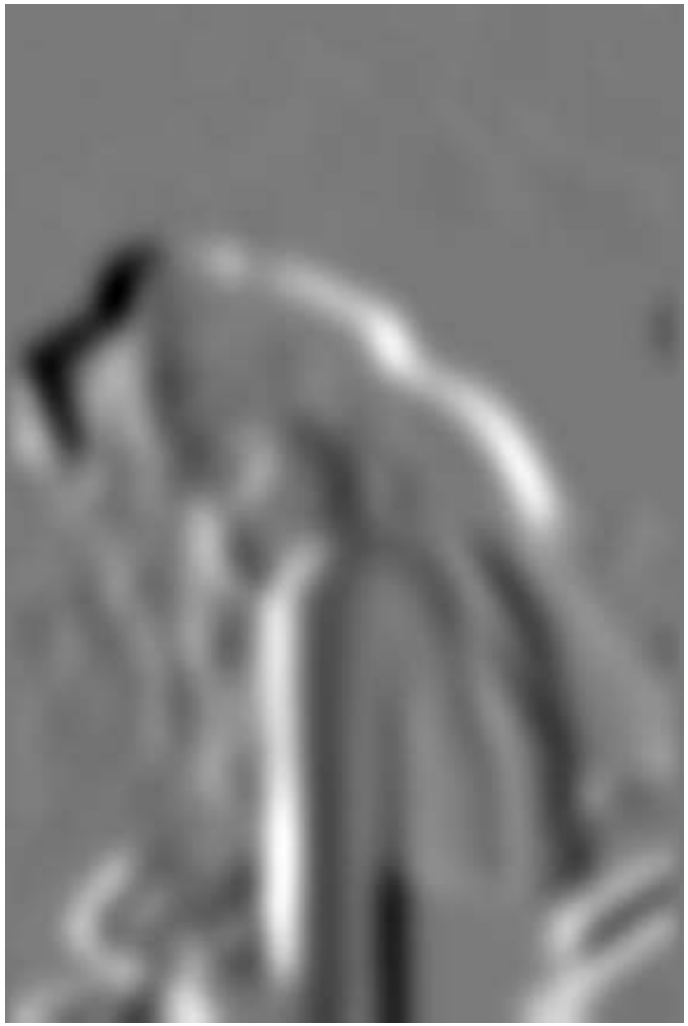




08. plot the (forward) first derivative of the solution of the heat equation with 1000 iterations

In [ ]:
```
plot_image_gray_2x1(u1000_x, u1000_y, '$u_x(t=1000)$', '$u_y(t=1000)$')
```

$u_x(t = 1000)$



$u_y(t = 1000)$