In [2]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [3]:
```
sm = pd.read_csv('sp.csv',encoding='latin-1')
#for first 5 data entries
sm.head()
```

Out[3]:

	Company	Location	Country	Date	Year	year_class	Time	Rocket	Mission
0	RVSN USSR	Site 1/5, Baikonur Cosmodrome, Kazakhstan	Kazakhstan	10/4/1957	1957	1957-67	19:28:00	Sputnik 8K71PS	Sputnik-1
1	RVSN USSR	Site 1/5, Baikonur Cosmodrome, Kazakhstan	Kazakhstan	11/3/1957	1957	1957-67	2:30:00	Sputnik 8K71PS	Sputnik-2
2	US Navy	LC-18A, Cape Canaveral AFS, Florida, USA	USA	12/6/1957	1957	1957-67	16:44:00	Vanguard	Vanguard TV3
3	AMBA	LC-26A, Cape Canaveral AFS, Florida, USA	USA	2/1/1958	1958	1957-67	3:48:00	Juno I	Explorer 1
4	US Navy	LC-18A, Cape Canaveral AFS, Florida, USA	USA	2/5/1958	1958	1957-67	7:33:00	Vanguard	Vanguard TV3BU

In [4]:

```
#for last 5 data entries
sm.tail()
```

Out[4]:

	Company	Location	Country	Date	Year	year_class	Time	Rocket	Mission	Ro
4625	SpaceX	SLC-4E, Vandenberg SFB, California, USA	USA	7/22/2022	2022	2012-22	17:39:00	Falcon 9 Block 5	Starlink Group 3-2	
4626	CASC	LC-101, Wenchang Satellite Launch Center, China	China	7/24/2022	2022	2012-22	6:22:00	Long March 5B	Wentian	
4627	SpaceX	LC-39A, Kennedy Space Center, Florida, USA	USA	7/24/2022	2022	2012-22	13:38:00	Falcon 9 Block 5	Starlink Group 4-25	
4628	CAS Space	Jiuquan Satellite Launch Center, China	China	7/27/2022	2022	2012-22	4:12:00	Zhongke-1A	Demo Flight	
4629	CASC	LC-3, Xichang Satellite Launch Center, China	China	7/29/2022	2022	2012-22	13:28:00	Long March 2D	Yaogan 35 Group 03	

In [5]:

```
#to get all the column headers
sm.columns
```

Out[5]:

```
Index(['Company', 'Location', 'Country', 'Date', 'Year', 'year_class', 'Time',
       'Rocket', 'Mission', 'RocketStatus', 'Price', 'MissionStatus'],
      dtype='object')
```

In [6]:

```
#to get data summary
sm.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4630 entries, 0 to 4629
Data columns (total 12 columns):
 #   Column         Non-Null Count  Dtype 
---  ------         --------------  ----- 
 0   Company        4630 non-null   object
 1   Location       4630 non-null   object
 2   Country        4630 non-null   object
 3   Date           4630 non-null   object
 4   Year           4630 non-null   int64 
 5   year_class     4630 non-null   object
 6   Time           4503 non-null   object
 7   Rocket         4630 non-null   object
 8   Mission        4630 non-null   object
 9   RocketStatus   4630 non-null   object
 10  Price          1265 non-null   object
 11  MissionStatus  4630 non-null   object
dtypes: int64(1), object(11)
memory usage: 434.2+ KB
```

In [7]:

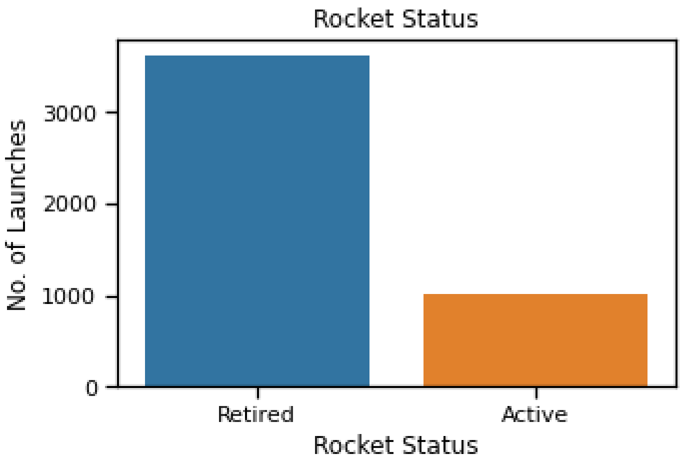
```
#calculating basic statistics measures
sm.describe()
```

Out[7]:

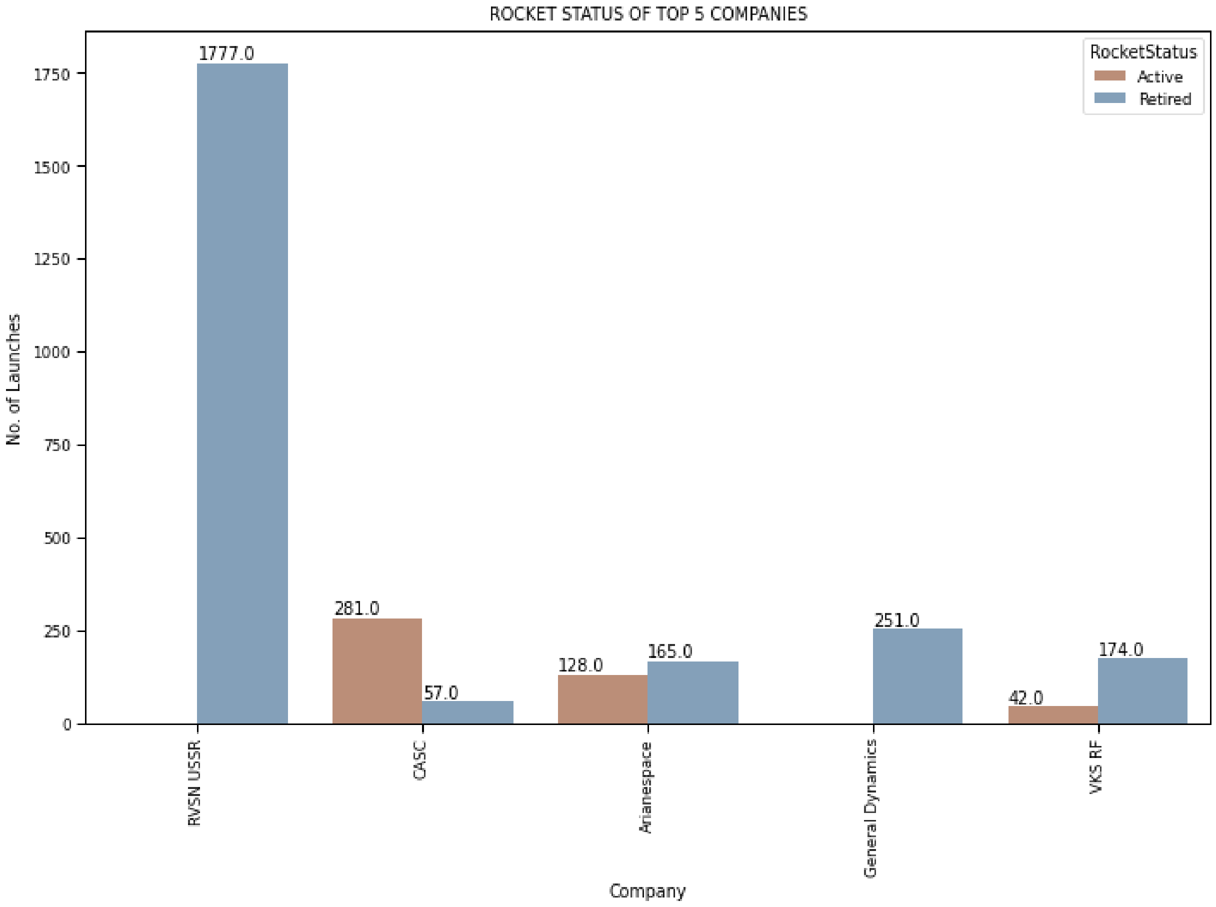
	Year
count	4630.000000
mean	1989.616199
std	19.373003
min	1957.000000
25%	1973.000000
50%	1987.000000
75%	2007.000000
max	2022.000000

In [8]:
```
sns.set_context("notebook")
plt.rcParams["figure.figsize"] = [5.00, 3.50]
plt.rcParams["figure.autolayout"] = True
b =sns.countplot(x='RocketStatus', data = sm) #using countplot
print(sm['RocketStatus'].value_counts())
b.set(xlabel ="Rocket Status", ylabel = "No. of Launches",
      title ='Rocket Status')
plt.show()
```

```
Retired    3620
Active     1010
Name: RocketStatus, dtype: int64
```

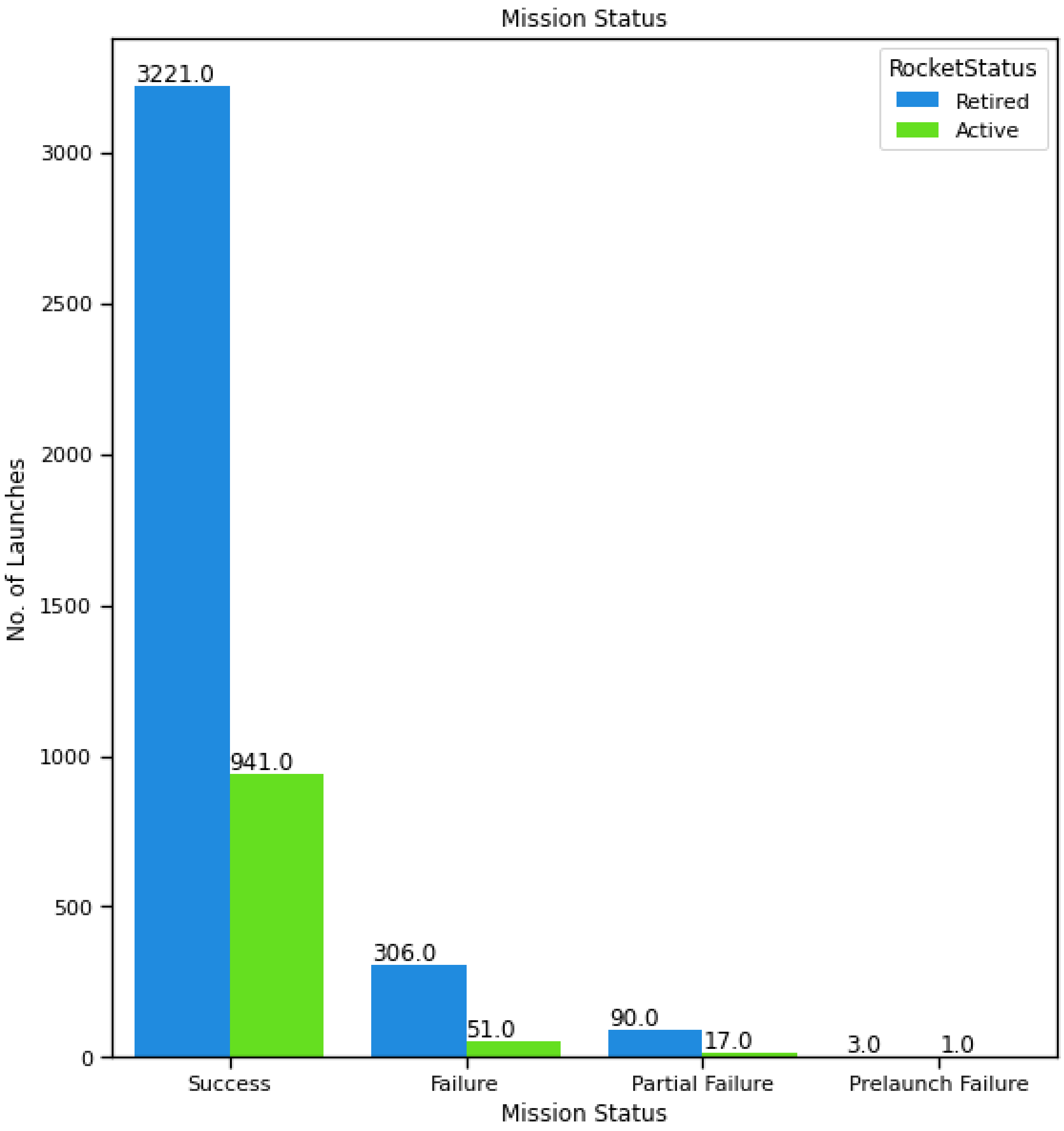


In [24]:
```
sns.set_context("paper")
plt.rcParams["figure.figsize"] = [10.00, 7.50]
plt.rcParams["figure.autolayout"] = True
an= sns.countplot(x="Company", hue="RocketStatus", data=sm, palette="twilight_shi
              order=sm.Company.value_counts().iloc[:5].index)
an.set(xlabel ="Company", ylabel = "No. of Launches",
      title ='ROCKET STATUS OF TOP 5 COMPANIES')
for p in an.patches:
   an.annotate('{:.1f}'.format(p.get_height()), (p.get_x(), p.get_height()+10))
plt.xticks(rotation = 90)
plt.show()
```



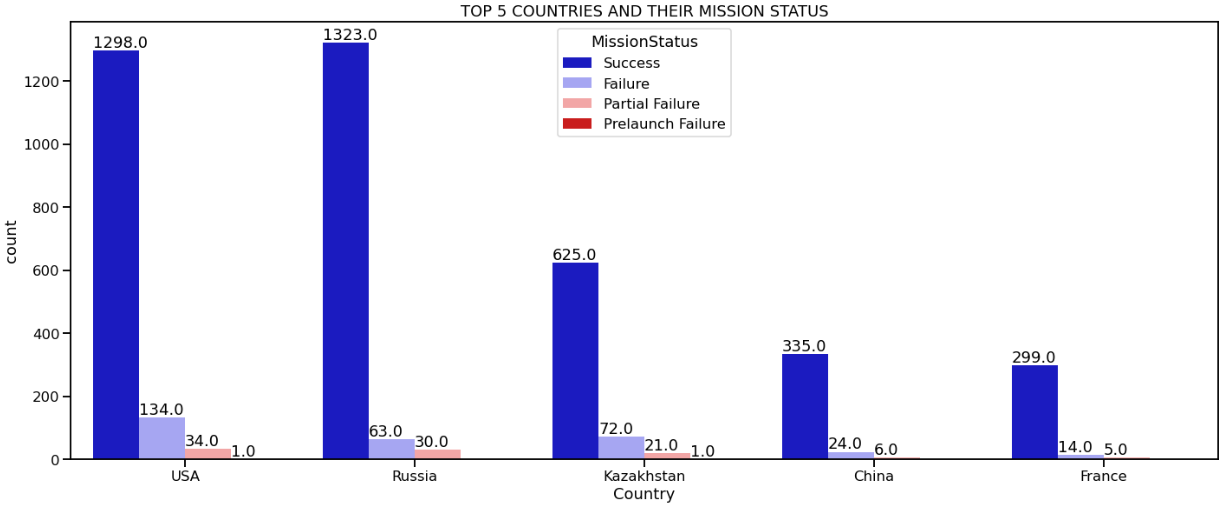
In [20]:
```
sns.set_context("notebook")
plt.rcParams["figure.figsize"] = [8.00, 8.50]
plt.rcParams["figure.autolayout"] = True
ax = sns.countplot(x='MissionStatus', data = sm, hue = 'RocketStatus', palette =
print(sm['MissionStatus'].value_counts())
ax.set(xlabel ="Mission Status", ylabel = "No. of Launches",
      title ='Mission Status')
for p in ax.patches:
   ax.annotate('{:.1f}'.format(p.get_height()), (p.get_x(), p.get_height()+15))
plt.show()
```

```
Success             4162
Failure              357
Partial Failure      107
Prelaunch Failure      4
Name: MissionStatus, dtype: int64
```



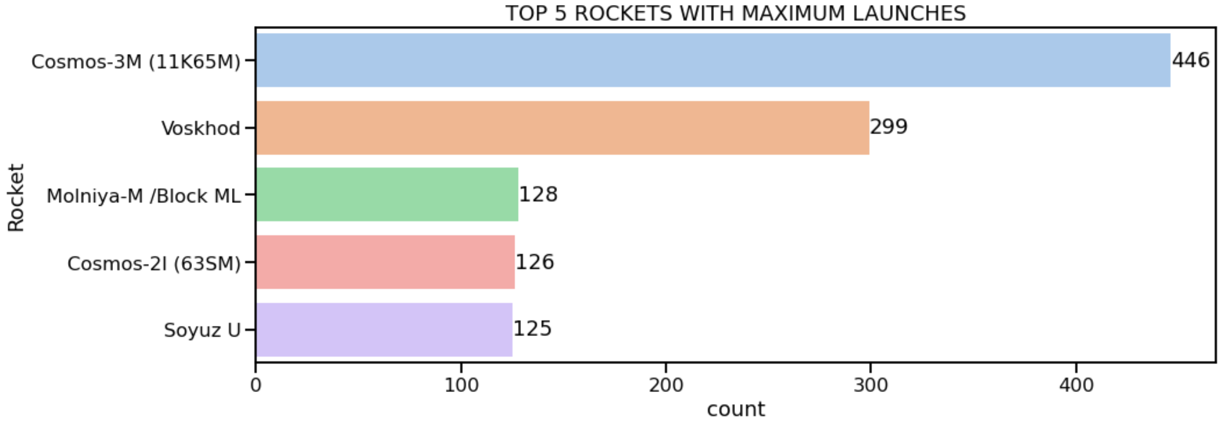
In [11]:

```
sns.set_context("talk")
plt.rcParams["figure.figsize"] = [20.00, 8.50]
plt.rcParams["figure.autolayout"] = True
an= sns.countplot(x="Country", hue="MissionStatus", data=sm, palette="seismic",
        hue_order= ["Success", "Failure", "Partial Failure", "Prelaunch Failure"]
                  order=sm.Country.value_counts().iloc[:5].index)
an.set_title("TOP 5 COUNTRIES AND THEIR MISSION STATUS")
for p in an.patches:
   an.annotate('{:.1f}'.format(p.get_height()), (p.get_x(), p.get_height()+10))
plt.show()
```



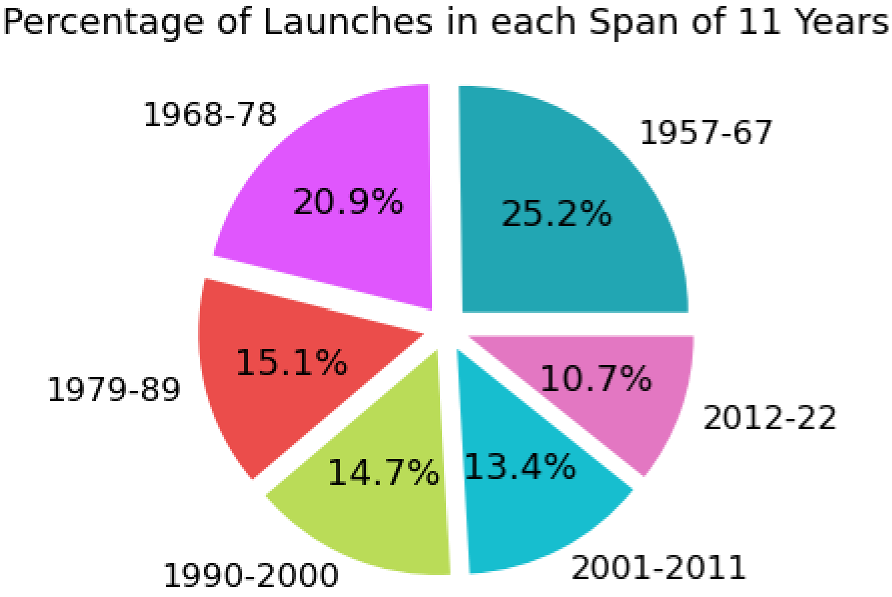
In [19]:

```
sns.set_context("talk")
plt.rcParams["figure.figsize"] = [15.00, 5.50]
plt.rcParams["figure.autolayout"] = True
a = sns.countplot(y="Rocket", data=sm, palette="pastel",
              order=sm.Rocket.value_counts().iloc[:5].index)
a.set_title("TOP 5 ROCKETS WITH MAXIMUM LAUNCHES")
a.bar_label(a.containers[0])
plt.show()
```

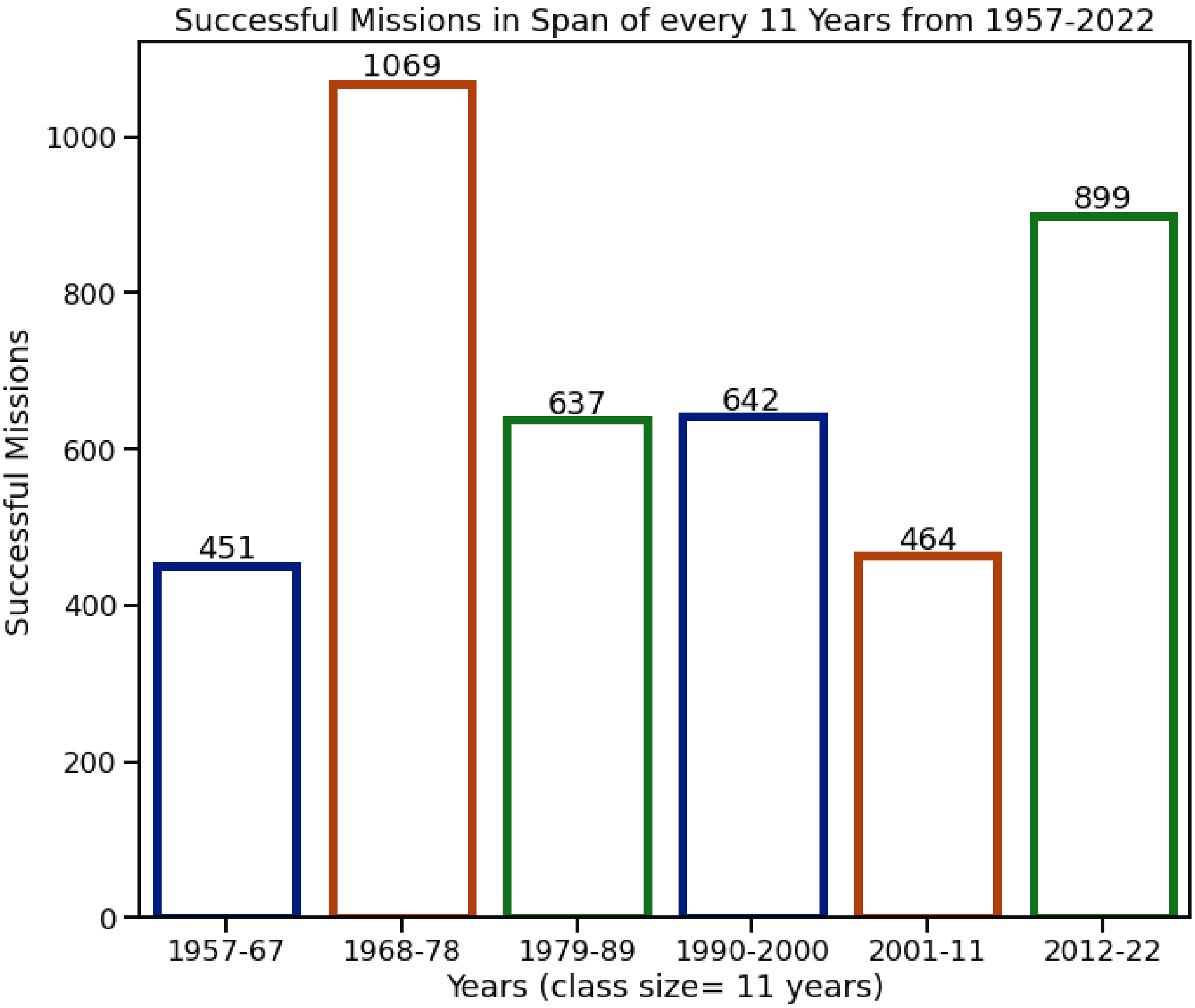


In [17]:

```
explode = (0.1, 0.1,0.1, 0.1,0.1, 0.1)
plt.rcParams["figure.figsize"] = [6.00, 6.50]
plt.rcParams["figure.autolayout"] = True
yr = sm['year_class'].value_counts()
colors = ('#22a6b3', '#e056fd', '#eb4d4b', '#badc58','#17becf','#e377c2')
plt.pie(yr, autopct='%.1f%%', explode=explode,startangle=0,colors = colors,
        labels = ['1957-67','1968-78','1979-89', '1990-2000', '2001-2011','2012-2
plt.title("Percentage of Launches in each Span of 11 Years")
plt.show()
```



In [14]:
```
sns.set_context("talk")
plt.rcParams["figure.figsize"] = [10.00, 8.50]
plt.rcParams["figure.autolayout"] = True
a = sns.countplot(x="year_class", data=sm, facecolor=(0, 0, 0, 0), linewidth=5,
                  edgecolor=sns.color_palette("dark", 3), hue = 'MissionStatus',h
a.get_legend().remove() # removing legend
a.bar_label(a.containers[0])
a.set(xlabel ="Years (class size= 11 years)", ylabel = "Successful Missions",
      title ='Successful Missions in Span of every 11 Years from 1957-2022')
plt.show()
```


Successful Missions in Span of every 11 Years from 1957-2022
Successful Missions
Years (class size= 11 years)